THE ENGINEERING AND MINING JOURNAL.

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NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

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"THE ENGINEERING AND MINING JOURNAL" ADVOCATES THE ADOPTION OF THE METRIC SYSTEM OF WEIGHTS AND MEASURES,

and urges all who are interested in the simplification of our present complicated and unsatisfactory systems to aid, by their active sympathy and encouragement, the early introduction of this much-needed reform.

AMERICAN INSTITUTE OF MINING ENGINEERS.

OFFICIAL BULLETIN.

NOTICE TO MEMBERS AND ASSOCIATES ELECTED AT THE FEBRUARY MEETING.

As it is understood that every one proposed as a member or associate of the Institute has personally expressed a desire for membership, the Council expects prompt acceptance of the election.

The ENGINEERING AND MINING JOURNAL, which contains the proceedings and papers of the Institute, is sent to all newly-elected members and associates from the time of election, on the presumption that there will be no unreasonable delay in accepting the election and paying the annual dues to the Institute, but the sending of the JOURNAL will cease with this number to all those whose acceptances have not yet been received by the Secretary. The JOURNAL will, however, be resumed when the acceptance is received, but the Institute cannot guarantee that back numbers will be supplied.

EASTON, Pa., March 30, 1877. THOMAS M. DROWN, Secretary.

A MARVEL OF TELEGRAPHY.

On Saturday morning, the 24th inst., took place the Cambridge and Oxford boat race on the Thames, and, incredible as it may seem, the work of transmitting the result by cable, setting up, stereotyping and placing the plates on the press ready for printing was accomplished in just *forty minutes* after the firing of the judge's gun. It is almost needless to say it was the *New York Herald* that performed the miracle. In its issue of Sunday morning it refers to it as follows:

"So complete were the preparations of our London bureau that, taking advantage of the difference of time and the early hour of the race, we were enabled to place a large portion of our city readers in possession of the result at their breakfast tables yesterday. This is the more remarkable when we reflect that the race ended at 8:51:14, and that the stereotype plates containing the result were placed on the presses at 4:30—forty minutes, actual time, after the finishing gun was fired."

VERBUM SAT SAPIENTI.

We believe it to be a well-established fact that when the officers of companies commence speculating (as opposed to investing) in the stocks of their own companies, it behooves investment stockholders to beware, and either change the management of the company or change their investments to some concern that does not possess this fatal symptom of decay.

It is more than intimated that some of the coal stocks are being actively manipulated in the interest of officials of the companies; and it is also very generally believed that the calling of meetings and appointment of committees to concoct combinations are made by some of the companies rather with the view of affecting the selling prices of stocks than with any real expectation that a working combination will be effected.

PROF. WURTZ' REPORT ON JAPANESE PORCELAINS.

One of the most valuable contributions to technical literature which emanated from the Centennial Exhibition is Prof. WURTZ' report on Japanese porcelains.

We regret that our limited space will not permit us to make more than brief extracts from this very able report, and we refer those who are interested in the subject to our excellent contemporary the *American Chemist*, where it will be found published in full.

Professor WURTZ was commissioned by the Judges of the Ceramic Department of the Exhibition to make investigations into the composition of the unrivaled Japanese porcelains which formed so attractive a feature of the great show, and the results of his thorough and exhaustive researches are full of interest. Perhaps the most striking result of his work is the discovery that Japanese and Chinese fine porcelains, contrary to our traditional conceptions, are not formed of *clay* at all, but of a purely siliceous rock mineral or petrosilex; and our use of the term kaolin to express porcelain clay, though borrowed from the Chinese name of the briquettes sold to the porcelain manufacturers, is, in reality, a misnomer—for these briquettes contain but very little alumina, and are not clay. As a consequence, these fine porcelains are by no means as refractory as the European or American china. On another occasion we will give the results of Prof. WURTZ' analysis; at present we invite the attention of our chemists to an ingenious device by which Prof. WURTZ greatly diminishes, if he does not quite obviate, the errors which are otherwise unavoidable in almost every analysis Prof. WURTZ, while making an analysis, carries on at the same time a *parallel blank analysis* in which the quantity of the reagents used and the steps in the operation are precisely similar to those of the real analysis, except that no substance is used in place of the mineral to be analyzed in the first place. By this device the errors due to the impurities of the reagents, and those incident to the manipulations in the assay, are eliminated, and an accuracy attained which cannot be secured by the ordinary methods. In the analysis of refractory materials the limit of error should not exceed the one-thousandth part of the assay, while in ordinary silicate analysis it is the one, two, or three-hundredths. Prof. WURTZ styles analyses made in the manner described "absolute analyses." The device is worthy the attention of our chemists, and will be, we have no doubt, generally adopted where great accuracy is required, as is the case in determining the composition of refractory materials.

The following description of the Japanese method of preparation and manufacture of porcelain is quoted by Prof. WURTZ from the Exhibition Catalogue:

"Whatever may be the nature of the raw material, be it quartz, felsite, kaolin, feldspar, or the peculiar porcelain-stone of Arita, it is always powdered by means of balancing pounders of a peculiar construction. These are composed of long horizontal beams with a perpendicular cross-piece at one end, giving the whole the shape of a hammer, and with a water-trough at the other end. This instrument is put up wherever a small stream of water can be utilized; the water running into the trough raises the pounder by overweight, and running out at the end in consequence of the incline allows it to fall down again, with the iron-shod cross piece dropping into a stone mortar, in which the materials are thus reduced to powder; the latter is then sifted, mixed with water and decanted.

"No other machinery, such as the quartz or glaze mills of foreign porcelain manufactories, is used, and the consequence is that all the material which cannot be sufficiently powdered by the above described pounders (amounting often from 40 to 50 per cent.) is thrown away as waste. The fine powders produced by decanting are carefully mixed and removed into flat boxes, where the water is partly drained off through a sand bedding, covered with matting, and partly tapped off from above the deposited clay; the latter is finally brought to more consistency by placing it on the warm furnaces. Long experience combined with the good quality of the raw material, enables the manufacturers to prepare a clay fit even for the production of very large pieces, such as vases from six to seven feet in height. These are chiefly manufactured in Arita, whereas porcelain tables, painted slabs, fireplaces and similar articles are mostly made in Owari. The throwing and shaping of the clay is done upon the common potter's wheel, which, in the town of Arita (Hizen), consists of a flying wheel and a working disk, twelve or fifteen inches one above the other. These are united by a sort of hollow wooden prism, so as to form one system of wheels, which is placed over a vertical round piece of wood, fastened in the ground. To avoid friction as much as possible, this system of wheels is resting upon the pointed stick by means of a hollow piece of porcelain, set underneath into the working disk. By means of this lathe the workmen in Arita turn out large dishes of three feet in diameter, as well as the so-called egg-shell porcelain, not thicker than paper. For very heavy and large pieces, the lathe is turned by means of a driving-cord.

"In all other provinces but Hizen, the lathe is of a more simple and imperfect construction, the flying wheel being at the same time the working disk.

"Moulds are also used, and made of ordinary clay. Since the Vienna Exhibition the use of gypsum for moulding is taught to the porcelain manufacturers of different places, and will most likely effect an important progress. Some of the pieces exhibited at Philadelphia have been made by the new process.

"When the pieces have been sufficiently dried in the open air, they are shaped with sharp iron tools on the same lathe on which the first throwing has been done, and are then coated with a very pure white clay,* so as to give the finished ware a better appearance, and to bring out with more intensity the fine blue color of the cobalt painting. After this coating, the ware receives the preliminary baking in small kilns built in the open yards of the manufacturing localities. The pieces are then painted with the oxide of cobalt, and afterwards glazed in the same way as in Europe. The glaze is always composed of a feldspathic material, either natural or produced by the mixture of different minerals, to which is added a certain quantity of wood-ashes freed from the alkali by careful lixiviation. The proportion of ashes depends on the place which the pieces have to occupy in the kiln, the heat of which is not quite uniform.

"The Tsuji-chuchi, the Shiro-chuchi and the Sakaime-chuchi are the principal materials for the body of the wares. The Tsuji-chuchi is the purest and whitest, but a little hard in the fire, so that it is generally mixed with Shiro chuchi (seven parts to three). It is more expensive, and hence used only for the best thin-body (egg-shell) ware.

"Shiro-chuchi and Sakaime-chuchi are considered as equally good, and are mixed in arbitrary proportions for the larger ware. This means simply that they vitrify at the same temperature, and are both sufficiently white. By floating and decanting, however, they can separate materials of various degrees of fineness; for very large pieces the coarser materials being used.

"The Tsuji-chuchi is the best and whitest, the most expensive, and at the same time the *most refractory*; not vitrifying so easily, and for this reason it is not used alone, but is mixed with a certain proportion of less refractory Shiro- or Sakaime-chuchi, even when compounding the body of the thin egg-shell ware; so that the mass may vitrify in the same fire as the larger and thicker pieces, made of the two latter minerals alone.

"There is still another most important point to be noted. These materials are powdered by very rude machinery, and it happens that, after sifting and floating, forty per cent. or more of the original mass is thrown away as waste, in the shape of a very coarse powder which has settled upon the bottoms of the floating tubs. Now, although so great a loss arises largely from imperfection of machinery, yet it may also be that the minerals themselves do not possess entire homogeneity of texture, but contain harder and softer parts, of which the former would be less perfectly

* The Kudaru-yama-chuchi, so-called by Dr. Wagener.

crushed. Hence, it would result that neither the waste nor the fine decanted product would have the same composition as the raw mineral; most likely in one of them the proportion of silica having been increased, and in the other the proportion of alumina. Thus your analyses might present discrepancies which would be inexplicable without taking these facts into consideration.

"When the body of the ware is finished, and before baking, it is coated with the Kudaru-yama-chuchi, also called Kesso-chuchi (which means 'whitening clay'). The object of this coating is to make the ware appear whiter, but also, and chiefly, to produce a finer cobalt-blue. After the first baking, the painting with oxide of cobalt is done upon the ground of Kesso-chuchi; then the ware is glazed and baked in the finishing kiln. The glaze is composed of the Uwakuszuri-chuchi and lixiviated wood ashes, mixed in various proportions, according to the place which the ware will occupy in the kiln, in which the heat is not uniform.

"The Shira-kawa-chuchi, mixed with Shiro- or Sakaime-chuchi, is used for the *craquelé*. The Sei-ji-chuchi is used for the greenish glaze, called 'seladon,' in the same way as the Uwa-kuzuri-chuchi."

In another number we shall give Prof. WURTZ' analyses of the different porcelain materials and porcelains.

THE WAGES QUESTION.*

Before telling what the wages question specifically is, it will be well to get a technical conception of the term wages, and Prof. WALKER's work thoroughly defines it. The lexicons say, briefly, "stipulated payment for service performed," but in political economy it has gained a more extended meaning.

This definition only applies to what is called "nominal wages," the "real wages" being the remuneration of the laborer "reduced to the necessaries, comforts or luxuries of life," or what he can get for his money. The purchase-power of money, then, rules the whole matter, and some space must be devoted to illustrating this for the purposes of future argument. The author's analysis is too minute to be given here, but several points in it are so novel and recondite as to demand notice; for example, the facts which affect historical comparisons of wages. The pound sterling of to-day contains litle more than thirty per cent. of the silver it did six centuries ago, and in Pennsylvania the dollar has varied in value from ninety to fifty-four English pence; like names for different values abound in every age and country. The amount of precious metals extant is a most important factor. Between the dates 800 A. D. and 1868 A. D. it grew from $1,790,000,000 to $14,010,700,000. Such stupendous changes could not fail to cause wide divergence between the real and nominal wages of different periods.

Among the considerations which affect cotemporary comparisons are fluctuations in value of the substitutes for coin, the influence of locality upon prices, the mode of living of the laborer, variety in the form of payment; and relative to the last of these Prof. WALKER furnishes an array of statistics as valuable as it is interesting.

It seems that "all the world over, full payment in money is highly exceptional where it is not wholly unknown," and this is especially the case with agricultural labor. The condition exists to its greatest degree in new countries where lack of money compels recourse to payment-in-kind, rent, board, allowances, perquisites and privileges. This practice the author considers disadvantageous to the laborer, and in some regions, Germany for instance, law compels that mechanical labor, at least, shall be paid for in coin of the realm. To resume, other causes of the divergence of real from nominal wages are:

1. Opportunity for extra earnings in some occupations and localities. A case in point would be where a father's wages were supplemented by those of wife and children. There might be a great apparent difference in wages with a substantial equality of family income, and, as Prof. WALKER observes, the family, "rather than the individual, ought to be the unit of income as it is of expenditure."

2. Regularity of employment which depends upon occupation, climate, social and industrial causes. Farm hands, it is estimated, can work but half the time in winter months that they can in the summer, and fishermen and brickmakers are perforce idle much of the time. Sickness disables the laborer 11·2 days of the year, as proved by lengthy observation, and *fête* days debar him from work, the world over, from six weeks to two months. Illustrative of an industrial obstacle to regularity of employment, some curious tables are furnished of the effect of "strikes" upon the laborer. Assuming the matter in dispute to be five per cent. addition to existing wages, *even if the movement succeed*, the man must toil continuously to make good his abstinence from work in the following ratio:

For one month	1 3·5	years.
" two months	3 1·5	"
" six "	9 3·5	" etc.

This should be graven on tables of stone in every industrial establishment.

3. Duration of ability to labor; it is impossible to condense Prof. WALKER's expression of this consideration. It is necessary, he says, "to know the total duration of his (the workman's) laboring power, that we may be able to compare the term of his productive with that of his non-productive life. It is evident, supposing two persons begin to labor productively at fifteen years of age and continue actively at work with the same rate of nominal wages till death, that the one receives a higher real remuneration who lives the longer, since the cost of his maintenance during the fifteen years of helpless life must, in any philosophical view of the subject, be charged upon his wages during his period of labor. It is true that the expense was, in fact, borne by his parents, while he will himself bear the cost of the maintenance in childhood of his own offspring; but no one will, I believe, question that in the economical sense the support of each generation of laborers should be charged against its own wages just as truly as that a farmer in solving the question whether a cow, dying at a certain age, paid for herself, would set against the proceeds of the sale of her milk and butter the expense of rearing her. If this principle of estimating the wages of a lifetime be accepted as just, its great practical importance will not be denied. Tables are quoted showing the duration of life of nationalities, in which Norway stands first and Ireland last. Certain occupations imply brief life, and in them nominal wages must be heavily discounted by reason of their destructive effect. Of the professions, mortality is greatest in the medical and least in the clerical. Tillers of the soil reach the greatest age, and workers in ores of the useful metals have a markedly short tenure.

All the preceding has merely gone to show that a man who earns two dollars a day is not necessarily twice as well off as he who earns only one, and to furnish a basis for ascribing values to the influences which modify comparisons of this nature. Now, then, what is the true wages question? In brief, it is simply the question of employment—not what wages the laborer shall get, but whether he shall have a chance to earn any at all. The contest—if we may call it so—is not between the capitalist and laborer, but between the latter and his employer, to whom "both alike are compelled to resort for the opportunity to produce wealth and derive an income." The author's sentences strung upon a thread of narrative will depict the situation better than any paraphrase: "The *entrepreneur* stands between the capitalist and the laborer, makes his terms with each, and directs the course and methods of industry with almost unquestioned authority. To laborer and to capitalist alike he guarantees a reward at fixed rates, taking for himself whatever his skill, enterprise and good fortune shall secure."

That the laborer acquiesces in this status, goes without saying; but he "does not accept the situation more utterly, more passively, than does the capitalist. Quite as closely does the man of wealth who has not been trained to business respect his own limitations; quite as little is he disposed to venture for himself." For example: "What have the capitalists done, what can the capitalists do, to help themselves in the event of a withdrawal of the business class? * * * They can lower their terms and offer their capital at diminished rates, affording enterprise thus a wider margin for profits; but if enterprise finds this inducement insufficient, the capitalist has nothing to do. The money lies in bank; the shops and stores are tenantless * * * The very fact that the veteran professional conductors of business have withdrawn from production or have greatly curtailed their operations is sufficient advertisement for him that it is no time for outsiders to push into the field. He knows that in the best of seasons a single venture into an industry of which he has had no personal experience, or even into one from which he has retired, but so long ago as to have become rusty in its methods, unfamiliar with its latest machinery, and strange to the *personnel* of the trade, might well cost him a year's interest in his fortune, while an attempt to carry on production merely for the sake of employing his capital in a time when the masters of the business shrink from the prospect of disaster would, most likely, cost him the bulk of the capital itself." The *entrepreneur* and laborer being, then, the immediate agents in the employment question—which is offered as a more precise title for the wages question—the case will need no adjustment if the parties thereto are shown to be on equal ground. Prof. WALKER argues that they are not, in the following manner: He dismisses the idea of antagonism, which implies destruction or supplanting, for the reason that they are respectively buyers and sellers of labor; and "unless that bargain be made, the employer cannot have his profits any more than the laborer can have his wages." That the laborer be employed is to the interest of both, the only points of difference possible being the rate of profits and the rate of wages.

The author quotes a mass of opinions without very clearly indicating his leaning either way, and they must be touched upon *en passant*. One of them attributes inherent weakness to the laborer for the reason that his commodity, viz., service, cannot be stored up, that it must be sold to-day, as to-morrow it will have ceased to exist. This is only true to a degree, as periods of abstention are generally attended by accretion of energy which goes far toward making good the time lost. This practice is so universal as to prove a certain fitness in it, and the capability of storing up the power of labor extends to greater periods than commonly supposed. This view, whether accepted fully or in part, seems to be a sort of two-edged sword, as the buyer is correspondingly damaged by the failure of the bargain. He can no more utilize a past capability of work than can the laborer. He needs must suffer too, for "if manual labor is withdrawn, land cannot yield rent, money interest, or business enterprise profits." To offset this presumptive disadvantage of the laborer, it is stated that prolongation of the estrangement would so exhaust the resources of the employer as to exclude him from his industrial order, while the laborer's capacity for work is to continue in full vigor. Why this superiority of "staying" power should be ascribed to the latter is by no means clear.

Professor WALKER, of himself, cites two reasons why the laboring class has the weaker position, which cause the more cogitation the more one reads them. The first is that the employers are few, and the employed many; this is his illustration: "If we consider the case of the manufacturer employing usually twenty hands, we may say that his need to employ those workmen is correspondent precisely to their need of employment. If the condition of his business would allow the profitable employment of twenty hands, his loss—if for any

* THE WAGES QUESTION. By Prof. F. A. Walker, of Yale College. New York: Henry Holt & Co.

cause he employs but nineteen—may be assumed to be as great as the twenty workmen, taken as a body, suffer therefrom. But here is just the rub: the twenty are not a body having a common interest. The loss is not to be divided equally among them. It is to fall entire on a single one of the number, and this calamity each one for himself seeks to escape. In the apprehension, amounting it may be to terror, of being left out of the number employed, each one of the twenty is ready to accept terms below the ordinary rate." Criticism of this is difficult, and is made glaringly so by an attempt to express the evil in one sentence and the remedy for it in another. So long as humanity is what it is, there seems to be no escape from the position. Until the spirits of rivalry and competition are dead in the breasts of mankind, the wrong will not be righted—no! not while even two men chance to desire the same thing.

The second of Professor WALKER's reasons for the laborer being at a disadvantage as compared with the employer, is his habitual poverty, and his situation is depicted in these words: "The vast majority, however, of all wage-laborers have little or no accumulations, many being even without the means of subsisting themselves a month or a week without work. They are, therefore, unable to stand out against their employers and make terms for their service, or to seek a better market for their labor in another town or city, but must accept the first offer of employment, however meagre the compensation."

Here again the author's yearning for that utopian sphere in which the social conditions, inseparable from this, do not obtain, leads him into a mess. Were it not for this very trait, the wages class would be bodily transferred to the capitalist class by his own definition, which includes in the latter "laboring classes, whether receiving wages or salaries, who are able, out of scanty earnings, to make savings," etc. Truly, if circumstances were not as they inevitably are, a different order of things might come in.

Solomon wrote—"The destruction of the poor is their poverty," and the matter may not be passed over with a wave of the hand. It is a peg on which to hang a reflection upon the wrongheadedness of many of the maxims for the conduct of life. It is the steady, unvarying undercurrent of expense that hinders the poor from making headway; the dribbling daily necessities in the shape of food, shelter, clothing, which must be met by the toiler even to hold his own. These attended to, the accidents of life have but a trivial effect upon him, and yet, every economic finger-post points to these emergencies as the things to provide for. Man, prone to the marvellous and exceptional, considers these instinctively, but is too apt to imagine that the unchangeable necessities will be supplied much in the same manner as the air he breathes. The former he encounters rarely; the latter are on the way while he sleeps.

The laborer's disadvantages are offset by as many on the side of the employer. The author specifies these as—first, the interest of the latter in the continuity of production. This means an interest "over and above the mere profits which he might expect to realize" during a period of suspension of industry. To follow the text, "the world of politics does not sooner forget a former leader in retirement, than the world of business forgets one who withdraws from the competition of trade. Even the strongest houses, however completely they may seem to have control of the markets in their line, do not like to have their customers and correspondents learn to go elsewhere through any failure of theirs to meet every demand upon them."

Second, the interest of the employer in the continuity of employment. This consists in knowledge thus acquired of the workman, mutual adaptation, familiarity of the workman with the peculiarities of his master's business, and "the loss of time or of energy which every change, simply as change, involves in a greater or less degree." A recognition of their weakness by employers is seen in grading wages somewhat according to length of service, and, even where this is not practiced, by the "preference given to their older employees in the event of a reduction of force; and since, as has been shown heretofore, regularity of employment is to be taken into account in reducing nominal to real wages, we may fairly say that these advantages are actually paid for in no inconsiderable amount."

To be positive implies a narrow mind; the wider the range of a man's knowledge, the more he shrinks from an unqualified dictum: yet we cannot but regret that with the store of research and observation Prof. WALKER furnishes, he should not have disclosed his own theory of the tendency and treatment of the influences he describes. It would necessarily have commanded respectful attention, and in default of it, each must ratiocinate for himself. The following is offered as a point of departure—granted that the wages question is only that of employment, and immediately between the *entrepreneur* and laborer,—granted that for equitable results both contracting parties should meet on the same plane of advantage,—what is Prof. WALKER's plan for bringing about such a consummation? Primarily, he demonstrates that four causes operate against it, viz.:

I. That employers are few and the employed many.
II. The habitual poverty of the laborer.
III. The employer's interest is deeply involved in continuity of production.
IV. The employer's interest is deeply involved in continuity of employment.

The first two militate against the laborer, the last two against the employer. It must be said that the Professor seems inclined to reduce social problems to the dreary communistic plane in which a penalty is put upon excellence of all sorts; in which the idle and inefficient have all the rights of the industrious and useful; in which a man may not enjoy the fruit of his labor, but must share it with those who have not worked for it, and in which the chief goal and desideratum is mediocrity. He cannot discern that sparkling crystallization of the mingled experience of centuries—"Some must paint, and some must grind colors." The writer is far enough from seeking to be flippant, but in the absence of any definite recommendation, a painstaking study of Prof. WALKER's language has only enabled him to deduce the following remedies:

I. That employers and employed should be equal in number.
II. That employer and employed should possess equal accumulated savings.
III. That customers should be compelled, under some penalty, to purchase the product of all manufacturers.
IV. That the employed should be hampered with sufficient disabilities to retain their services perpetually to the same employer.

Then the wages question would be settled.

Feb. 1, 1877. S. W. R.

NEW PUBLICATIONS.

GEOLOGISCHES REPERTORIUM, *mit einem vollständigen Index* (Geological Repertory, with a complete index). VON BERNHARD V. COTTA. Leipzig: 1877.

This is nothing less than a chronological catalogue of the literature of general geology from the middle of the sixteenth century to the present time. COTTA's reputation is such that we need do no more than state to our readers what his work professes to be, in order to show them what it really is. We learn from the Preface that this book is the first part of a History of Geology, the second part of which is to be a condensed critical survey of the gradual advance in the different departments of geological knowledge. This preliminary volume, while it does not enumerate all the literature of the subject, comprises the titles of the most important contributions that have been published, either as separate treatises, or as papers in scientific journals. Mineralogical, chemical and palæontological essays on special points, and manuals, school-books and popular treatises not containing "new and fruitful views" have been purposely omitted. The titles cited are arranged chronologically, without attempting to classify them under the various subjects or localities to which they refer For this avoidance of the error into which KEFERSTEIN was betrayed, in his otherwise very complete and valuable "History and Literature of Geognosy" (1840), we are grateful to Prof. COTTA. Too much classification is not good for books of reference. Who would have his dictionary arranged like a grammar, the nouns being separated from the adjectives? What is required in such books as the one before us is a simple arrangement and thorough indexes. KEFERSTEIN furnished neither; COTTA gives us both. The index of authors, containing 1,362 names, the index of places, referring to 948 countries, districts and localities, and the index of subjects, 1,544 in number, afford ample means for the convenient consultation of the work by the two classes of students—those who know what they want to find, and those who want to find what they ought to know. We welcome the work as a most important contribution to the means of research, and still more warmly as a proof of renewed strength and activity in the hand from which it proceeds. We had feared that Prof. COTTA had permanently withdrawn himself from scientific labors of any magnitude; but the plan he has now projected and inaugurated promises to be one of the most brilliant of a very brilliant series.

NOTES.

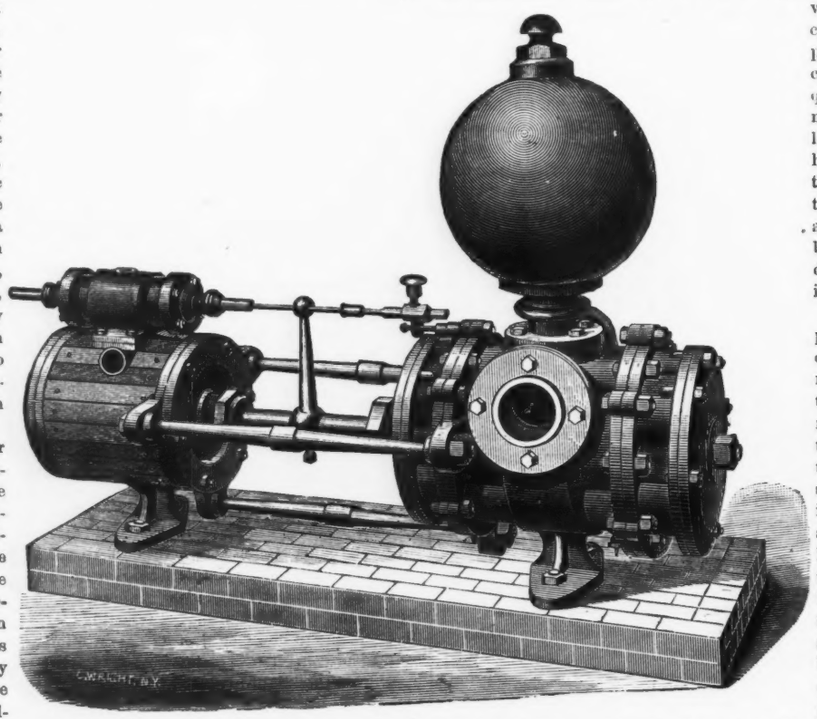
THE EMIGRATION OF MINERS TO AUSTRALIA.—A number of miners from the Pennsylvania coal regions and the Lake Superior copper mines propose leaving this port (New York) early in April for New South Wales. The Commissioners of Immigration at Sydney furnish free transportation by railroad and steamboat to the country districts, if demanded three days after.

TEMPERING SPRING AND TOOL STEEL.—If steel is heated to redness and allowed to cool slowly, it becomes nearly as soft as pig-iron, and can be as readily worked. If, however, when so heated it is suddenly cooled, as by plunging it into water, it becomes very hard and brittle. Between these two extremities almost any degree of hardness may be given steel, and in diminishing its hardness to the point that has been shown to be the best for certain uses consists the art of tempering. With the explanation that seems almost unnecessary, that in tempering the steel is made very hard, and then its hardness reduced by heating it to a certain point indicated by the color of the steel, or, if heated in oil, by the color of the smoke or by flame, we give some rules to be observed in tempering. (1) The steel should be very hard before tempering. If the articles to be tempered are not properly hardened at first it will be time and labor lost to temper them. (2) The heat for tempering should not be too suddenly applied. The slower the heating the tougher and stronger the steel. (3) The most careful and experienced workman is liable to be deceived in the color of the steel, and consequently in the temperature in an imperfect light or at twilight. (4) Where water is used for plunging the steel in, the less frequently it is changed the better, provided it does not get greasy. The temperature to which the steel should be raised for various purposes is shown by the color of the steel when heated. Lancets, which must be very hard, in order that they may be ground to a keen edge, are tempered to the faint yellow tinge, equal to 430° Fah., while razors and surgical knives, which must be less easily broken, are tempered to the straw yellow, equal to 450° Fah. Penknives are tempered upon an iron plate over the fire, the blades being laid upon it on their backs until they have acquired the full yellow color, equal to 470° Fah. Cold chisels and large shears for cutting iron must stand rougher usage, and are therefore tempered to a brown yellow, equal to 490° Fah., while the brown with purple spots, equal to 510° Fah., marks the tempering heat for axes and plane irons. Table knives are heated till they acquire a purple color, equal to 530° Fah., in order to let them down to the proper temper, and articles in which great elasticity is required, such as swords and watch springs, are tempered to a bright blue, equal to 550° Fah., while saws are brought to the highest temperiug heat at which the dark-blue color shows itself. This temperature, about 600° Fah., is that at which oil boils and inflames, so that a bath of oil is very frequently used in tempering, the articles being immersed in it and the temperature ascertained either by a thermometer or by the volume and color of the smoke which rises from the oil. Some tools are annealed by plunging them into oil heated to 400° F., and allowing them to cool down in it. Small steel tools, after being hardened by chilling in water, are coated with tallow heated over a flame till the tallow begins to smoke, and then stuck into cold tallow. Large steel implements are let down to the proper temder by being heated in a kind of oven known as a muffle.—*Iron.*

THE NATIONAL STEAM PUMP.

This direct-acting steam pump is manufactured by Wm. E. Kelly, at the National Iron Works, New Brunswick, N. J., according to the patents of A. J. Loretz. As will be seen from the accompanying cuts, the pump is of very simple construction, and has several features both novel and excellent. The steam and water cylinders are connected and kept in line by means of three brace-rods, instead of by a solid plate, as is usually the case; some advantages are claimed for this arrangement. The main steam-valve is the well-known piston-valve, and the opposite ends or faces perform the function of auxiliary valves in combination with the main valve-chest, which also performs the office of an auxiliary cylinder.

The main valve stem, when the engine is running fast, carries the valve to its proper position, being secured to the valve by a swell or auxiliary tappet, confined in the center of the bore of the main valve by two heavy steel springs, secured at each end of the valve between a counter bore and a collar screwed to a shoulder. There is a certain amount of play, or lost motion, between the swell and springs, in order that the stem may be moved for the admission and expulsion of steam into and from the auxiliary cylinders, without moving the main valve or auxiliary piston.



The auxiliary-valve has four slots cut in the stem, and combined with passages in the valve chest bonnets, communicating with auxiliary cylinder and main valve chest. The valve is so arranged that the main engine, through the medium of the tappet-lever on the main piston-rod, closes the main valve and auxiliary piston; but before the valve is entirely closed, the auxiliary valve, or slots in the valve-stem, combined with the ports in the valve-chest bonnets, admit or emit steam on the respective opposite sides, closing the main valve entirely, and opening the same on the opposite side, thereby admitting and emitting steam into and from the main cylinder for a return stroke.

The movement of the main valve and auxiliary piston from end to end of the valve-chest is checked by the same springs that secure the valve-stem to the main valve. The valve and auxiliary pistons are driven to and fro by two combined actions, being started by the main engine, and afterwards assisted by the auxiliary steam motor before mentioned, and still further aided by a spring which is kept compressed by the steam during the stroke of the main engine until the valve is started for the return stroke, when the spring is released, the valve being locked in position by the pressure of the steam until ready for the return stroke.

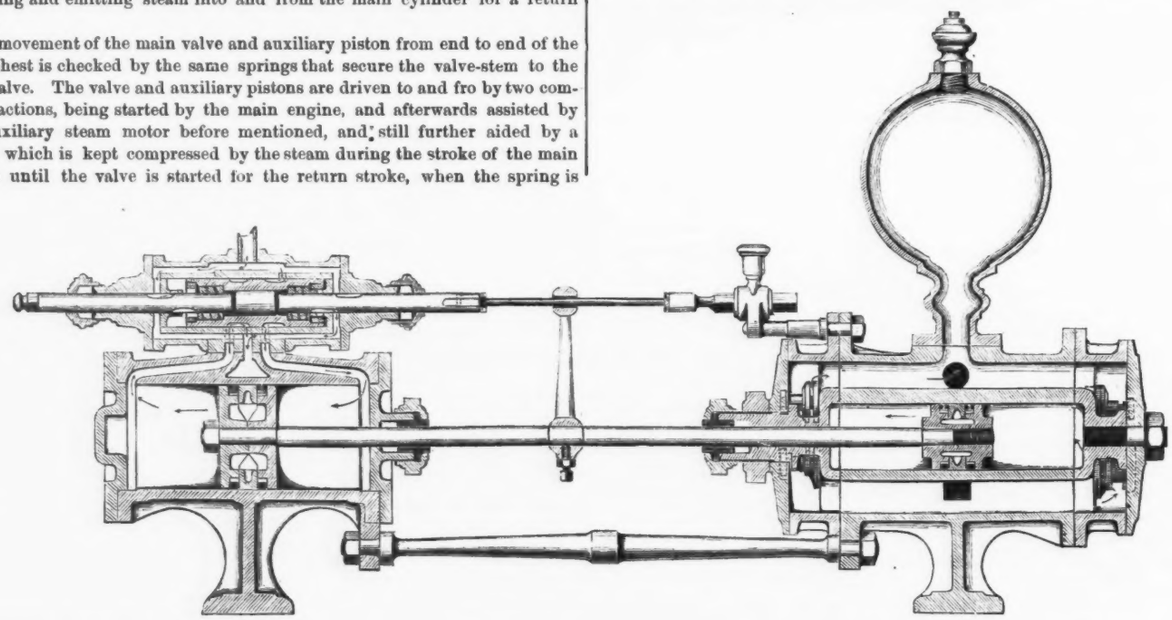
The advantages of this arrangement are evident. In most valve gears the blow of the valve against the chest-heads is checked by cushioning on steam in various ways; some by closing the exhaust-ports before the valve reaches its destination; others by admitting steam; while still others have steam or air-cushions attached to the valve gear, all of which have obvious disadvantages.

When a pump is started, or is running very slowly, the pipe is filled with the water of condensation, and the greater the length of the pipe, the greater the condensation. It is claimed that this pump will run as well with water as with steam; consequently, if the pipe is full of water, the effect would be that of a hydraulic engine, and this pump might be used to raise water above the source of supply for the purpose of operating other machinery.

In the construction of a good pump there should be as few angles as possible for the water to pass in entering and leaving the cylinder, as every angle adds to the labor of the motive-power. In this pump the suction and delivery valves are in the heads of the cylinders, each having an area proportioned to that of the cylinder, never less than one-quarter in the smallest pump made; there is also no space left between the piston and heads. The construction of the motive-valve gear is such that the strokes of the pump are of uniform length, there being hardly any perceptible difference whether the pump is running slow or fast.

In some cases the suction-pipe is connected at the top of the cylinder in lieu of connecting directly with the bottom passage. This arrangement may have its disadvantages, but it is claimed that they are more than compensated for by the result obtained in the working of the pump, a siphon being formed which keeps the suction-valves continually immersed in water. The instant the piston moves, the water enters the cylinder and follows the piston, the belt acting as a siphon to draw the water up the suction-pipe, the pump being always charged, and consequently drawing water without difficulty.

By removing a bonnet at each end of the cylinder, access may be had to any of the valves, and they may be removed and replaced with their seats, and every passage examined. From its simplicity and the special features of construction above enumerated, the pump has given a satisfaction in actual work which has made strong friends of those who have used it.



We are informed that to this pump was awarded the highest medal and diploma at the late Centennial Exhibition, and the silver medal and diploma at the American Institute Fair and at the New Jersey State Fair for 1876.

THE EFFECTS OF STOCK GAMBLING IN SAN FRANCISCO.

The San Francisco *Morning Chronicle* has recently published a series of articles on the evils that have resulted from the spirit of gambling which has long had possession of that city, and it has also been warning investors against the snares set for them in the great webs of the bonanza spiders. There is much good sense in the remarks of our contemporary, and did our space permit we would make copious extracts from its articles. As it is, we must be content with a few texts which are full of meaning for many of our readers outside of San Francisco :

"The simple truth is that this whole business of mining stocks has been fearfully overdone. We are, as it were, awakening from a wild dream of wealth never to be realized. The shock is severe, but let us hope it is only temporary, to be followed by new and more successful efforts in other directions. The fairy tales to which we have listened too long have made of us a race of speculators—little better than gamblers in fact—spurning the slow but honest ways of our fathers, and staking everything upon the interested reports of men who, if necessary, would claim the power of seeing through a millstone. Thousands of our best men and women have been ruined, literally wrecked in body and mind, by this terrible vice ; for the anxiety caused by the constant wearing away of one's fortune often wears out and prostrates the mental and physical powers also. It has absorbed much of the fortunes of other thousands who are still able to hope on ; it has taken away the daily earnings of servants and laborers, keeping their families pinched in poverty and rags ; and worst of all, it has so unsettled business credit that it has become dangerous to trust any man without securing the collaterals in advance, for, though he may have been rich yesterday, to-morrow he may be a bankrupt through ill-advised stock speculations. Now, is it not time to pause and look this evil square in the face, that we may find, if possible, some way to profit by the bitter experience of the past ?

"No intelligent capitalist would take any of our non-productive mines at their present inflated value and carry them on under the prevailing extravagant methods. Why, then, should people of small means do it? Experience has shown that those who invest in such properties, paying the assessments to aid the development of the mines, almost universally lose money, while the manipulators of the stock make the money, though at the same time they may retard rather than promote development. And those who invest in dividend-paying mines for the interest usually lose most of their principal, for they do not buy, as a general thing, until the property has been inflated to such an extent that the dividends will never equal the price of the stock.

"There are in this city four stock boards engaged in the business of buying and selling mining stocks. They have a membership of about three hundred, many of whom have partners and most of them from one to several clerks. Altogether there are probably one thousand men living off the business of stockbroking. There are in this city not less than sixty thousand, and in the State at least one hundred thousand people who either regularly or occasionally invest in stocks. During the past two years some have made money, a few have grown very rich, and about ninety-nine out of one hundred have lost money. There are now in this city about ten thousand men and women who are trying to make a living by speculating in stocks. Most of them are intelligent people, capable of doing a vast amount of useful work in the various occupations of life ; but in their haste to get rich or anxiety to retrieve losses, they are waiting for a 'strike' or a 'deal,' and yet tremulously fearing there may be a decline instead. Thus they suffer day and night a thousand times more than they would from the aches and pains of useful toil."

NOTES.

THE SULPHUR BANK QUICKSILVER MINE, CAL.—This mine is located in Lake County, on the east bank of the east arm of Clear Lake, and about ten miles from the town of Lower Lake. It is, perhaps, one of the most remarkable deposits of cinnabar in the known world, being 1,800 feet long by 750 wide, and the lowest depth yet reached is probably 100 feet. The ore is better at this depth than at the surface. The assayer, Mr. M. J. Walsh, informs us that they had no means of ascertaining its thickness, but supposed it to be several hundred feet, and that the deeper they dig the higher the grade of ore, and all the cinnabar found thus far contains a greater quantity of sulphur than any other known, but notwithstanding this fact it has yielded a large per cent. of silver from the surface. The mine is worked by large open cuts, and quarried direct into carts, thus doing away with all the expensive machinery needed in other quicksilver mines. Not only is the Sulphur Bank fabulously rich, but it has conveniences which no other mine possesses. Near by, between four and five miles, are five limestone quarries, to which there are fine wagon roads. The rock is hauled and burnt on the premises for lime. All the brick needed is also made on the premises. The works are extensive, consisting of six furnaces, five of which, of the Lightner patent, are for fine ores ; the other is for coarse ores, and is made after the Knox & Osborn patent. They have just finished another, different in construction from either one of the above, for the purpose of burning soot, patented by the superintendent, Mr. Lightner. There are three benches of retorts, and when they will have completed all the works now in course of construction, they will be able to reduce 100 tons of ore per day. The company have just finished the building of a large flume, 4 by 4, and 1,500 feet long. Also, six rotary driers, for the purpose of drying the ore before it is put in the furnace. The Company have about 4,000 acres of land, and it is used for grazing and farming purposes, and extends along the water front some ten miles. An extra large steam tank-pump of the Hooker patent, with a 5-inch pipe 750 feet long, which forces the water from the lake to fifteen large tanks above the works on the hill, has just been put up. This supplies all the water needed, which is conducted to all parts of the mine through pipes. The number of men employed to carry on this extensive mining operation is 175, most of whom are Chinamen, who do the principal part of the work, with white men for overseers. The Sulphur Bank produces from 900 to 1,000 flasks per month, and when all the works are fully completed the product will be largely increased.

NAPHTHA WELLS IN RUSSIA.—A few miles from the town of Bakou, in the Caucasus, are situated the naphtha wells of that district. For hundreds of years naphtha has been extracted by the natives from this locality, and the quantity underground appears to be unlimited. A well 81 feet deep is shown to the visitor which was dug two hundred years ago by the Persians when they were masters of the country. In summer, when gases are generated in the bowels of the earth, the naphtha is thrown up in jets, some reaching 100 feet in height above the ground, and then runs to waste in the absence of means to collect such large quantities of this oil. Mr. Churchill, the British Consul at Resht, Persia, reports that while at Bakou last year, on his way to his post, he visited the wells on the neighboring plateau of Balakhana. He says that in 1874 the tax of 25c. per pood (36 lb.) of petroleum produced brought the Government 280,000 r., showing a produce of 1,120,000 poods of petroleum, and a consumption of three times that amount of naphtha. In that year upwards of 180 manufactories were at work in the outskirts of Bakou, but, owing to the enormous competition of American petroleum, many of the smaller manufactories have been compelled to shut up. The two largest are at Surakh Khana, eight versts from Balakhana. This spot was chosen for economy of fuel, as gas issuing out of the surface is used in lieu of coal or naphtha. You have at Surakh Khana the wonderful sight of green fields and waving corn, in the midst of which the removal of a foot or two of earth will reveal a jet of gas that will raise an enormous blaze if set on fire. It is here that the Hindoo monastery of fire-worshippers is established, where a tongue of flame is perpetually kept up. But against the advantage of cheap fuel must be set the expense of transport from the naphtha wells. The average price of petroleum at Bakou is stated by the Consul at 1r. 10c. per pood, and the cost of transport to Moscow at 57c. There is great room for economy in the transport of the raw material to the manufactories, which might be effected, as in America, by constructing a railway with suitable tanks, or by means of gravitation through an iron pipe ; and some saving might also be obtained in the process of purifying the petroleum. It is only by such means that the Bakou petroleum can compete with that of the United States. The naphtha makes a very good substitute for coal in steamers employed in the Caspian Sea.—*Capital & Labour.*

ON THE DETERMINATION OF CARBON BY MAGNETIC TESTS.*

BEING A RECORD OF SOME ADDITIONAL INVESTIGATIONS MADE AT THE WORKS OF THE OTIS IRON AND STEEL COMPANY, CLEVELAND, OHIO.

By C. M. Ryder.

During the four months that have passed since my first communication to the Institute,† I have had my method of determining carbon in constant use, testing every variety of steel produced at the works, both by taking tests from the furnace and by tests taken from the product in the various stages of manufacture. It has been my endeavor to ascertain by the tests taken at the furnace and from the ingots just what the mechanical working of the finished product would be, in advance of the actual use of the steel, and I have succeeded in this undertaking even better than I expected to. I have been unable to determine the tensile strength of bars and plates very closely, the indications of carbon by my apparatus in most instances agreeing better with the breaking of the specimens in the testing machine than any previous chemical tests.

The medium grades of steel I have tested by bending under a steam-hammer, and have found an equal degree of uniformity to exist between the carbon indications and the mechanical test. Spring steel I have tested by making springs from a single bar, and testing under steady pressure and sharp blows with a steam-hammer. None of the samples showing a proper degree of carbonization have failed to stand both blows and pressure. I have found this method of great value in testing the steel during process of manufacture in the mill, any shearing or end of bars or plates being used as test pieces whenever I desired to ascertain its fitness for a certain use. The quickness and simplicity of this method for testing steel in bars or plates will make it of great value to parties handling or using considerable quantities who have no facilities for other tests.

An apparatus can be designed for this particular use, at a slight expense, which may be portable and would be ready for use at any moment, the whole being contained in a case less than two feet long and six inches deep.

My investigations have also proved to my satisfaction that the percentage of manganese in steel may be estimated by this apparatus, not as closely as carbon, but close enough to be of great value to a steel maker, and that the simplicity of the test is not materially affected by this new element. I have not perfected this feature as much as I hope to, but think I can determine the manganese in any sample of sufficient size, at least within ·10 of one per cent. of the actual analysis. Slight differences, or such are expected to occur in the manufacture of steel for a particular use, will not affect the carbon indication ; but wide differences in this element have an important influence on the indication, and if a standard is used in testing which is just right for the particular purpose for which the steel is intended, any improper proportion of manganese would not pass unnoticed.

The electro magnet to which I alluded in my first paper has proved a success, and it was by means of this that I first obtained satisfactory tests of manganese.

I have watched closely for the effects of various impurities on this process, but have not noticed any particular effect from the presence of phosphorous or other impurities in the steel.

NOTE UPON METHODS OF DRAWING METRIC AND OTHER SCALES UPON ENGINEERING PLANS.‡

By P. Barnes, of New York City.

If it be admitted that the use of the metric system of measurement is desirable, and that it will be well, as urged by one of our engineering societies, to show upon all our plans or drawings a metric scale in addition to a scale of inches, then it becomes important to introduce some ready means of drawing these scales.

For many present purposes it is quite sufficient to space off and to draw them with the common dividers and the right line pen, but if the number of drawings made or copied in an engineer's office, and upon which scales must be shown, is more than two or three daily, then some more mechanical or automatic means should be provided.

For the great majority of detail drawings, a simple transcript of the surface of a good two-foot rule would answer every purpose, and probably the best comparative showing of the metric scale would be made by drawing a line of millimetres close by the side of the line of sixteenths. This would be in fact little more than the transfer of one of the common copper-plate comparing scales to the surface of the drawing itself. For most detail drawings this comparing scale ought to be at least 18 inches long, so that any dimension less than 18 inches can be taken off at a glance, and hence some mechanical appliance becomes indispensable for the prompt and accurate drawing of the scales.

The old-fashioned stencil plate is obviously the first thing to be thought of for this purpose, and for a great deal of such work it is of course perfectly adapted. If, however, it is needful to make fine hair lines, and to make them only sixteenths or millimetres apart, then one difficulty at least will arise—that of keeping the stencil constantly in perfect order so that the lines shall be certainly and accurately made.

The next thing likely to be thought of is some form of printing press or stamp, and this could be made to answer perfectly if the total length to be printed were only 3 or 4 inches ; but for the assumed length of 18 inches, the press and stamp that would be needed might be costly and troublesome to handle. An obvious modification of this is a rolling stamp by which the lines of the scales may be printed, but the task of inking a roller properly, if used for printing in the ordinary direct way, might prove troublesome and difficult. If, however, a roller or rolling disc be used in connection with and upon a strip of carbon paper, then the trouble about inking and keeping the roller in good order quite disappears, though the question may remain

*A paper read before the American Institute of Mining Engineers at the New York meeting, February, 1877.

†The paper referred to was published in the ENGINEERING AND MINING JOURNAL, Vol. XXIII., page 27.

‡A paper read before the American Institute of Mining Engineers at the New York meeting, February, 1877.

whether the common carbon paper will answer perfectly for printing upon all kinds of drawing paper and upon tracing cloth.

It might be found that a steel disc could be made with the lines representing the fractional divisions so sharply raised upon its circumference that by rolling it across the drawing—guided by a T square or ruler—the scale divisions could be cut clear into the paper, or depressed, so as to serve as perfectly the needed purpose as if printed in ink or by a stencil.

It seems probable, however, that in order to print the sixteenth scale and the millimetre scale with one and the same movement of such an instrument across the paper, they would have to be cut upon separate rollers or discs, the circumference of each being so fixed as to give an exact number of inches and of centimetres in a single revolution. By this means all the larger fractional divisions can be given, each with its distinguishing length of line, and probably no very serious trouble could arise from the chance of one wheel being stopped for an instant, while the other still revolved, in passing across the paper. A weight could readily be attached to such an instrument so that the two discs would bear uniformly upon the paper, and thus ensure a perfect imprinting of the scales.

If the discs were made as large as 6 inches in diameter, thus giving the desired 18-inch length of scale with one revolution, then all the essential figures could be put on their circumference so as to be printed at the same time with the scale lines. To engrave these figures, however, might add materially to the cost of the instrument, and in any case not much time would have to be spent in writing the needed figures with a pen.

It may be said that there is little new or strikingly useful in the device and methods thus suggested, but it sometimes happens that the definite and exact statement of what may thus be done in well known ways has opened a way of doing the same things in better ways, and of doing some similar but more useful things besides.

NOTE.—Since the preceding was written, Messrs. Heller & Brightly have suggested that the disc or roller stamps would be costly and would require some special adjustments to ensure their correct working. They are inclined to think, however, that a series of lines may be so engraved in relief upon a strip of metal that it may be used for printing the proposed scales with perfectly satisfactory results with carbon paper or even with common printing ink. It would be needful only to lay the metal printing strip on the carbon paper and to rub it with the hand, or to press it with a simple heavy roller.

THE GODERICH SALT REGION.*

By T. Sterry Hunt, LL.D., F.R.S.

(*Continued from page* 186.)

The above-described section shows, in the 520 feet of strata below the top of the first salt bed, six layers of rock salt, measuring in all 126 feet, without counting the considerable amount of salt present in thin layers and in veins throughout the rocks.

These beds of rock salt, as we have seen, are not alike in purity. The first is scarcely suitable for mining, while the second is remarkably pure, and the third approaches it in this respect. The latter two beds, which measure together over 60 feet, are separated from each other by a layer of less than seven feet of rock, and for practical purposes may be regarded as one great workable mass of rock salt. It was desirable to determine the composition of this salt, and especially of the purely white and translucent portion of the second bed (Division VIII.), measuring, as has been shown, above 10½ feet. The quality of this portion, as seen in the cores, was apparently uniform, but in order to insure an average of the mass, portions of equal size were broken from each foot of the core, and the ten specimens thus got were crushed up together to get a sample for analysis. This was chemically examined under my supervision by Mr. Gould, the determinations being made in duplicate, and found to agree very closely. The result was as follows, the chloride of sodium being determined differently :

Chloride of sodium	99·687	Insoluble in water	·017
Chloride of calcium	·032	Moisture	·079
Chloride of magnesium	·095		
Sulphate of lime	·090		100·000

From the above analysis it appears that, deducting the adherent moisture, the amount of foreign matters in this salt is 0·234, or less than a quarter of one per cent. Its remarkable purity will appear when this result is compared with the analysis of the best commercial salts, the impurities of which are essentially of the same kind. In the case of the rock salt of Cheshire, in England, I copy from a report printed by the British House of Commons, in 1873, an analysis of "Crushed Marston rock salt," made by Mr. Crace Calvert for Messrs. Fletcher & Rigby, as follows: Chloride of sodium, 96·70; chloride of calcium, ·68; chlorides of magnesium and potassium, traces; sulphate of lime, ·25; insoluble matters, 1·74; moisture, ·63=100·00. This gives of foreign matters, deducting the moisture, 2·67 per cent., or more than eleven times as much as the Goderich rock salt. Another analysis of Cheshire rock salt, cited by Watts in his "Dictionary of Chemistry," gives 1·70 per cent.; and one, the famous rock-salt of Cardona, in Spain, 1·45 per cent. of foreign matters.

The salts got by evaporation from sea-water and from brines, with which our markets are in great part supplied, contain nearly as much impurity. From data gathered by me, and published some years since in a report of the Geological Survey of Canada, already referred to, it appears that the amount of foreign matters in Turk's Island salt is 2·34; in Saginaw salt, 2·00; in Syracuse solar salt, 1·15; and in the boiled salt from the same locality about 1·50 per cent. Of the salt made at Goderich, from the brines pumped from the salt-bearing-strata of the region, three samples, analyzed by me in 1871, gave—for coarsely crystalline salt, 1·097; flaky medium salt, 1·282; and fine salt, 1·625 per cent. of foreign impurities. The fine salt, which is the least pure, is made by boiling, the others by slower evaporation. The analysis by Dr. Goessmann of another sample of Goderich boiled salt gave 1·50; while the rock-salt from the layer of 10½ feet in Division VIII. of the section, as we have seen, contains only 0·234 per cent., or less than one-sixth of the amount of foreign matter found in the boiled salt made from the Goderich brines.

A considerable portion of the impurities in the commercial salts which we have thus compared with the Goderich rock-salt, consists, it is true, of sulphate of lime (gypsum), which is not actively injurious; but the brines of Saginaw and Syracuse, and, to a less extent, those of Goderich, contain (as I have shown at length in the report of 1869, already quoted,) chlorides of calcium and magnesium, which, in the ordinary methods of salt making, accumulate in the pans or kettles, and give to the salt very objectionable qualities, unless they are removed by chemical processes, as is done in the superior quality of dairy salt made at Syracuse.

The less pure salt, which overlies the pure white salt layer in the second bed, was examined, like the preceding, by taking small portions from each foot of the core, and making from them an average sample. It was analyzed, as before, with the following results: chloride of sodium, 91·24; chloride of calcium, ·57; chloride of magnesium, ·05; sulphate of lime, 2·81; insoluble in water, 5·33=100·00. The impurities, consisting of gypsum and marl, are very irregularly distributed through the layers; and it would appear from an inspection of the cores, that by a proper selection it would be easy to get a large proportion of salt much purer than this, and probably equal to the Cheshire salt, of which the analysis has been given above. The same is true of the greater part of the third bed (Division X). These great masses above and below the white salt would yield in abundance salt for agricultural and manufacturing purposes, and probably for the salting of provisions, while the layer of pure white salt, when ground, would give a product which for the dairy and for table use would be unequalled in purity and in beauty.

The saliferous strata of Staisfurth and Douglashall in Germany, and in some other regions, contain, as is well known, soluble salts of magnesia and of potash, which, in the localities named, have been found of great economic importance. A careful examination of the cores from the Goderich boring was accordingly made, in order to determine in these the presence or absence of such compounds. Samples were taken not only of the solid salt of the various salt beds, but of that found in veins and thin layers, or disseminated throughout the saliferous strata. The following is a description of the samples from the various divisions of the section :

Division V; marls; saline efflorescence on the core, from 983 feet.

Division VI; first bed of salt; glassy salt, 1,000 feet; granular salt, 1,026½ feet.

Division VII; dolomite and marl; white granular salt in vein, 1,031 feet; red fibrous, at 1,057 feet.

Division VIII; second bed of salt; dark, glassy salt, 1,085 feet.

Division X; third bed of salt; white glassy, 1,092½ feet; white opaque, 1,095 feet; white transparent, 1,100 feet; white, with marl, 1,116½ feet; reddish, 1,121 feet.

Division XI; marls, etc.; reddish salt in marl, 1,127 feet; reddish irregular lumps in marl, 1,134 feet; white granular in marl, 1,142 feet; white like the last, 1,152 feet; white, vertical vein in dolomite, 1,178 feet; small grains in dark porous dolomite, 1,180 feet; grains like the last, 1,183 feet; thin layers of dark brown salt in porous dolomite, 1,192 feet; reddish salt in vertical seams in dolomite, 1,201 feet; reddish salt as before, 1,205 feet.

Division XII; fourth bed of rock-salt; colorless and transparent salt, 1,208 feet.

Division XV; marls; red granular salt, 1,272 feet; red granular salt, 1,283 feet; red fibrous salt, 1,294 feet; red fibrous salt, 1,314 feet.

Division XVI; marls; granular salt with anhydrite, 1,420 feet; white glassy, 1,500 feet; brine from 1,500 feet.

Of each of these specimens, twenty-eight in number (without counting the brine from the bottom), there was taken a gramme or more, which was dissolved in a little water and examined for potassium, by the addition of platinum chloride and alcohol, but in no case was there found an appreciable quantity of potash-salt, the soluble material being in every instance nearly pure chloride of sodium. The brine from 1,500 feet in like manner contained only traces of potash salt, with small portions of the chloride of calcium and magnesium.

TO BE CONTINUED.

*A paper read before the American Institute of Mining Engineers, at the New York meeting, February, 1877.

HYDRAULIC MACHINERY AT THE PHILADELPHIA EXHIBITION.

Special Correspondence of the Engineering and Mining Journal.

THE J. & H. GYNNE PUMPS.

The firm of J. & H. Gynne manufacture their pumps at Hammersmith, near London. Their only display at the Exhibition was that of a model of a pair of the pumps erected by them to drain the Ferrara marshes in Northern Italy. Before speaking of these special pumps it will be well to consider briefly the peculiar construction of the pump made by this firm.

The wheel or disk which carries the radial arms for driving the water is made without side plates. In place of the usual side plates a central plate starts from the base of the disk and gradually decreases in thickness until at the outer edge of the arms it terminates in a knife edge. This central plate serves two purposes, that of holding and bracing the arms and also of preventing reflux currents in the water which enters on both sides of the disk. Turned collars on the disk work closely without touching against seats in the casing, preventing the back flow of water to the suction pipe. By doing without the side disk plates, considerable loss of power, from their friction with the water is prevented, it is thought, by the designers. The arms to the disk vary in number from three to six, and for two-thirds of their length they are made radial, the remaining third being curved backward in a direction opposite to that of its motion. The advantage of curving the buckets in this manner was long since recognized, and is due to the fact that the water is not thrown from the disk in a tangential direction against the outside of the discharge passages when they are not thus curved; and also to the saving in *vis viva*, which the water has acquired in passing through the disk. The space which encloses the disk is not made cylindrical, but is narrowed down from the axis outward. The arms are narrowed in the same manner, so that the total area of the openings between the arms at their extremities is the same as that of any section taken at a less radius. This area is also the same as that of the inlet and outlet pipes. By making them the same, the velocity of the water is kept as nearly constant at all points as is possible. Experience has demonstrated that unless all areas through which water is passing at similar velocities is the same, a considerable loss of power will take place. The discharge passage for the water from the disk surrounds the latter, and is a gradually increasing volute, having its smallest section vertically over the center of the disk spindle, and increasing from there to the discharge opening, which adjoins the starting point of the volute and separated from it by an iron diaphragm.

When discharging freely, the disk is found to deliver at each revolution three times its own volume. In consequence of this fact, the volume of the volute discharge opening is made equal to three times the cubical contents of the disk space. This keeps the velocity of the water constant in passing from the disk to the discharge pipe.

All the moving parts, disk, disk-spindle, bearing rings, etc., are made of steel. The bearings of the spindle are made of phosphor bronze.

The volute discharge portion of the casing is cast in one piece and side plates

which bolt on to this, enclose the disk, and carry the two branches of the suction pipe which go to the center of the disk.

The pumping engines at Ferrara, after which the model shown at the Exhibition was constructed, move a greater bulk of water than that moved by any other pumps in the world.

The Ferrara marshes covered an area of over 200 square miles, and the water now drained from them amounts to a flow of about 450,000 gallons per minute. This amount of water, which is over ten times that supplied to New York City, has to be raised through a mean lift of 7 feet 3 inches, and a maximum lift of 12 feet. Four pairs of the pumps, such as were represented by the model, are used to lift this enormous mass of water. Each pair is driven by a directly connected compound engine. The engines in each set are horizontal, and bolted to a single bed plate. The two pumps are placed at either side of the engine, their bed plates being securely bolted to the central one. The crank shaft of the engine is prolonged on either side, forming the spindles for the pumps.

The pumps have disks 5 feet in diameter; the suction and delivery pipes being 54 inches each in diameter. The volute casing around the disks is 15 feet in diameter, and each one is cast in a single piece. The diameter of the cylinder to the engine is respectively 27¾ inches and 46⅝ inches, the stroke being 2 feet 3 inches. The condensation of the steam from the low-pressure cylinder is effected in a very simple manner. The water ejected from the pump is passed through a number of three-inch tubes enclosed in a casing, and the steam is exhausted into this casing. The air pump is placed under the engine, and is driven by an eccentric from the crank shaft. The steam pressure used is 70 pounds per square inch, the engines making about 115 revolutions per minute. The lifting capacity of these four sets of two pumps each is, at the low lift (7 feet 3 inches), 456,000 gallons per minute, or 656,640,000 gallons per day of 24 hours.

MINING NOTES, LAKE COUNTY, COLORADO.

TO THE EDITOR—SIR: Some time since I told you that our district was entering on what I believed would be its most prosperous season, but although our spring is still a long way off, and 4 to 5 feet of snow on the ground, I can already see that my most sanguine expectations will be realized. Prospecting has commenced with great activity, and every week, I might say every day, sees a discovery each one richer than the last. Among our new discoveries I will mention the Camp Bird, owned by Gallagher Brothers, which is taking out ore running 934 oz. in silver, 4¼ oz. in gold, and 50 per cent. in lead. The ore is being shipped daily to the Malta Smelting Works. The Adelaide, owned by Frank Walls & Co., is an immense deposit of carbonate, averaging 22 oz. in silver, and 50 per cent. in lead. The William Redick, owned by T. O'Brien, John McLain and D. Dogherty, has struck carbonate at a depth of 50 feet. The deposit is one of the largest in the district, and although only the top ore has been assayed, it averages 76 oz. in silver, and 66 per cent. in lead per ton. The owners will commence shipping ore to the works this week.

The fine lode owned by T. O'Brien, D. Dogherty, J. Drennan and A. Milner is only just struck, and the ore will run high, judging from present indications. The Bulldozer, owned by Frank Bradshaw & Co., has also just struck, and runs 65 oz. in silver per ton. The extension of the Wonder, owned by Woods & Co., shows six feet of mineral. The Best Friend, owned by Lee, Doyle & Co., has run as high as 4,008 oz. silver per ton, and is, I believe, a true fissure vein. The Columbus, owned by Kauffmann & Reschie, has ore running 220 oz. in silver per ton, and shows a crevice 2 feet wide between walls. There are several others discovered within the last few days that I have made no assays from as yet.

The smelting works will start up for the spring in a few days. Speaking of this, I must mention a communication that I regretted very much to see in your issue of January 27th, headed "A smelter wanted." It may be an undoubted fact that the immense quantities of ore that our district will yield this season will give plenty of work to more than one smelter, but the communication in question was evidently written with the intention of casting a slur on the Malta Smelting Works and their gentlemanly and efficient manager, Emile Leoscher, Esq., simply because the owners of the Dana, having had a slight misunderstanding with the Malta Works, choose to send their ore out of the county. Other works may in time be wanted to supply a market for our rapidly increasing quantities of ore, but such a want will not result from any fault in the management of the works we already have. To show you the liberal dealing of the Malta Smelting Company, I enclose you their schedule, from which you will see that their prices are higher than the New York schedule. I can safely say that at the present time, when none of the old mines have yet started work for the spring, there are ten thousand tons of ore in sight.

On the Mike lode, owned by Hayes Brothers, Lynch & Starr, a tunnel of 500 feet is rapidly approaching completion that will tap the mine at a depth of 250 feet, and expose an immense body of ore; in fact, I can now see that Lake County will, as I have always predicted, rapidly take front rank in the mining districts of the State. Our mining facilities as to wood, water, easy access by good roads, etc., are unsurpassed. The ground sluicers are in high spirits, as the supply of water will be more than usually plentiful, and I expect that each succeeding letter it will be my pleasure to write to you during the coming season will be a record of our increasing prosperity.

ORO CITY, Col., March 19, 1877. M. H.

A TRUE FISSURE VEIN OF LIGNITE!—The Ione *News* says the Ione Coal and Iron Company are busy opening a new shaft, boring and testing the extent of the coal bed, and erecting machinery. The sample of 100 tons proved of excellent quality. The Central Pacific RR. Co. are now having several of their locomotives prepared specially for the consumption of it in the future, and the many predictions of extensive business at these mines are on the verge of being verified. It is the hope of the Company within a short time to ship from there daily a thousand tons of coal. If this coal turns out to be of as good quality as reported, and can be laid down in San Francisco for, say, $5 per ton, it will go far towards solving the question of cheap fuel. Dr. Henry, a mining expert well known on this coast, has been in Santa Rosa recently, making an examination of the coal mine in Taylor or Cotate mountain, about three miles from the town. He reports an excellent prospect. The vein measures nineteen inches, with well defined walls. He pronounces it a true fissure vein of coal. Dr. Henry advises the Company to follow the vein one hundred feet further, and then start a level and cross-cut. He thinks the vein will widen to three, or perhaps four feet, and the vein would then be of great value. The quality of the coal, he says, is not equaled on the coast, except from the Wellington mine in Vancouver. It is a very superior lignite, and it will coke a little, but not enough for a gas coal. For steam and domestic purposes it is not surpassed on the coast. The Sonoma *Democrat* says this is a statement of the facts about the mine just as they exist. [Surprising facts! Just think of a "true fissure vein" of lignite!!—ED. E. & M. J.]

ABSTRACTS OF LECTURES ON MINING.—No. XXXIV.

By Prof. W. W. Smyth, M.A., F.R.S., Royal School of Mines, London.

(*From the London "Mining Journal."*)

The question of sinking in actual water by the method which we considered at the end of the last lecture has proved to be not only feasible but economical. There have been some cases of failure where inexperienced persons have attempted to apply a similar method, with slight alterations, to avoid breaking the patent. Near the town of Mons there might be seen a remarkable instance, in which close upon £100,000 was spent to get a shaft down, and yet it had only gone down a few fathoms, while Kind and Chaudron had been successful in getting their shaft down to the bottom of the difficult ground. There is one more point to be noticed in the lowering of the great mass of tubbing. There is fastened by means of flanges to one of the segments a casting of a sort of diaphragm, or false bottom, across the shaft. In the center of the diaphragm is a tube, in which water can rise as the mass descends in the shaft. Although the water which is in the shaft gradually rises up this tube, the pressure of the water below on the diaphragm supports a very large proportion of the whole weight; and the weight can be increased if required by letting in some water on to the top of the diaphragm, or lessened again by pumping this out. In the case of a shaft where the total weight of the tube was 800 tons, not more than 40 tons at any time was allowed to rest on the rods. The principal Government Inspector of Belgium reported that he was satisfied that certain sinkings carried out by this method cost not more than one-third what they would have cost by the ordinary method.

It is very important to recollect that, according to what may be needed, we may in some cases commence the shaft at several different points, whilst in other cases we can only commence at the surface. In mines, for example, where an inclined shaft has been put down in the lode, and after a time it is found that it would be better to have a perpendicular shaft, a careful survey will be made, and cross-cuts driven out to the proper points, and then from some or all of these shafts will be begun upwards and downwards. And this in some instances has been actually the means of saving the mine for some years, seeing that if the shaft had to be commenced at the surface in hard ground it might have taken several years. There is another point connected with sinking—that is, it is extremely desirable to take great precautions for the safety of the men. In sinking perpendicular shafts, as in the collieries, it is usually the case that they have no precautions, except a careful banksman, to prevent strangers coming up to the mouth. Consequently, when a brick or bucket happens to fall it is almost sure to be fatal to some one, and, unfortunately, accidents are extremely frequent. The plan more usual on the Continent, and in most metalliferous mines, is to have some sort of staging, or penthouse, to shelter the men. Of course, it may be said that in the former case the ventilation is more free and open, but a little arrangement would soon put that right. In the metalliferous mines the shaft will be carried down to a point where a sollar can be put in, and below that sinking will be carried on with special precautions. Stemples are put in, the boards placed on them, and then a few feet thickness of attle placed on; so that if the iron kibble happens to break away there is very little chance of it going through. A windlass below this mass of timbering, or penthouse, draws up the material to the staging, and a little to one side is the place for the kibble to come down. There is no doubt that this penthouse saves a great number of lives. We have to recollect that all the other precautions for conveying things in the shaft are vastly more inferior in metalliferous mines than in collieries, so that there is much more reason for penthouses being put in the former case.

Having considered the question of driving horizontal levels, and of sinking and securing vertical openings, we have now to consider how best to remove the great bulk of the mineral lying between the levels. There will be a great difference in the manner of working, according as to whether the mineral is disseminated throughout the veins or confined to particular parts of it, and whether the veinstuff be soft, so that you can take it out completely when once you commence to work it. In many mines you may notice that the ground worked away comes in in a number of irregular patches, perhaps with a tendency to shoot in some particular direction, and that the dead ground is as much as, or more than, the ground worked away. The French employ the term "exploitation" to all connected with the working away of the mineral. We have to consider the inclination, thickness, substances of which composed, depth at which it occurs, the character of the ground on either side, and also as to whether the whole of the material has to be taken away, as in a good seam of coal or ironstone, or only a portion, as in the majority of mineral veins. All these matters have to be taken into consideration in determining the method of working any particular deposit. There are a few general rules to be kept in view throughout the exploitation. 1. One of the objects to be remembered in making the arrangements is the keeping clear of water. This has been often transgressed where it has been attempted to make a small mine pay. It must be borne in mind that water makes its way through mining ground at very different rates, according to the nature of the ground; sometimes you have to drive almost into a place before you can release it of water. 2. The way in which you should dispose the works with respect to the shafts and levels as to make the carriage and transport of mineral and the haulage economical. 3. Attention to ventilation, not to work in the face of deficient ventilation; and this is not only for the safety and health of the men, but also because it effects a saving of time (that is, not having to wait a long time for the gunpowder smoke, etc., to clear away), and because in a bad ventilation men cannot exert their full powers. 4. Always to keep certain portions of the work in a state of advancement, making preparations for this ultimate exploitation, and this is a vital and most essential point in respect to lode working. 5. The disposition of the men in the most efficient way throughout the mine, disposition of the working places so that the greatest number of men may be brought to bear with advantage, and yet that they be not overcrowded; this depends on the special character of the vein to a great extent. 6. The question of extracting the total useful mineral without waste, or danger to the men or the mine. 7. There are certain cases where the surface of the ground has to be looked to, and to be considered as to the effect likely to be produced by the underground workings —*e.g.*, when passing under the sea, or under cottages, gardens, roads, etc.

The general plan of laying out these operations in collieries and open work we have seen consists in dividing the ground into a series of steps, what the metallic miners call stoping, and this will take place with more or less regularity according to the nature of the ground. In some cases the men climb up to their work by the aid of a chain, or up steps cut in the sides, on to the stage on which they work. The method applied in metalliferous mines up to the end of the last century, and still to be seen in a great many mines, is that known as underhand stoping (German, *Stossen-bau*). The floor of the level is replaced by timbers, and then a succession of stopes, or steps, is worked, each

6 or 7 feet high, and 3 or 4 fathoms between the stopes. The stopes might also be commenced from the shaft, standing on transverse timbering. Some means has to be provided for disposing of the attle, and a number of boards, therefore, put in (stulls, or buntings—German, *Bühne*), and on these the rubbish will be thrown, so that as the working advances forward and in depth these stages have to be continued and multiplied. There will obviously be a difficulty of getting the mineral up to the level if we adopt the usual mode, so that spaces are left from time to time, and windlasses are put in over a small shaft for hoisting the material, and the method entails a great deal of under ground manual labor in winding windlasses. This miserable system of mining may still be seen in some old mines, working from hand to mouth. But in the German mines in the last century, and introduced into this country at the end of the century, was brought out the method of overhand stoping, or *Firsten-bau*. The usual plan is commencing from a shaft or a winze to take away a stope about 6 feet in height, replacing the natural roof of the level by timbers. The attle is thrown behind, and forms an inclined plane, on which you can mount up to the upper workings. The level below subserves the purpose of a hauling level; the ore is got rid of by fitting a little shaft up with dry stone or rough timber, through which the stuff can be dropped into the level below. In many cases, where they are not very particular about keeping their levels open, they let it accumulate below; but this is a clumsy way, the material should be removed to the plat, or else a trapdoor should be placed at the bottom of the small shaft so that the mineral might accumulate in that until it was allowed to fall out into the wagons underneath. On comparing the two methods you see, first, the one must be extremely economical as regards woodwork when compared with the other; then, a large amount of wages is saved by doing away with the windlass work; and, in the third place, there is the question whether a man cannot get a much larger quantity where the ground is hanging—in most mineral veins he can. There are certain instances in which the method of underhand stoping will still have to be employed. Take the case, for instance, of ground in which you have cross joints, fissures in different directions, in the overhand method the man would be working in a dreadful trap. Again, if you have very heavy ground, and have to use the double-handed hammers, the underhand method may be found preferable. Lastly, where you have very valuable minerals, either as principal or secondary products, if the rock falls on to a mass of attle, as in the overhand stope, a great deal of mineral may be lost, while in the other method it will fall on to a floor, which can be cleaned, and spread with boards, or even cloths. Although underhand stoping may have to be employed in certain special cases, yet in the majority of our mines, all through the German mines, and in other countries, overhand stoping is followed. There are some districts where it is difficult to get the men to change from one system to another; among these is the south of Spain. In this district are a number of lead mines, working thoroughly well by a system of underhand stoping: two sets of stopes incline towards a central part; and there is one advantage here—that the working is not begun till the preparatory work is complete, and then the ore is thrown down a small central shaft into the level below.

NOTES.

A HEAVY ENGLISH COAL FAILURE.—The London *Times* of the 29th inst. announces that Thomas Greener, a coal merchant of Darlington, has failed. His liabilities are reported at £200,000.

NEVADA CENTRAL RAILROAD.—The running of trains on this road has been resumed after a stoppage of several months. The road, which is 18 miles long, extends from Pioche, Nev., to Bullionville, and is chiefly used for carrying ore from the Pioche mines to the mills.

THE DELAMATER IRON WORKS are constructing a mining plant for the Champion Iron Company of the Lake Superior District. The plant will include two powerful engines, an air compressor and six drums, each seven feet six inches in diameter, all to be placed in a new stone building with slate roof.

SEATTLE AND WALLA WALLA RAILROAD.—This road is now completed from the town of Seattle, Washington Territory, southward to the Renton coal mine, about 15 miles, and has been formally opened for traffic. The shipments of coal from the Renton and Talbot mines are now to pass over the road to Seattle as their shipping point.

COPPER IN NOVA SCOTIA.—A Halifax company is working copper mines at Waugh's River, Tatamagouche and at River John. Already about ten or twelve tons of ore has been sent to Wentworth station, thence by rail to Halifax and by steamer to England. The ore is put up in kerosene casks, each one weighing when full nearly 1200 pounds. —*Halifax Chronicle.*

A NEW INDUSTRY, extracting tannin from sweet fern, has been started in Hancock County, Maine. From a ton of sweet fern it is said that a barrel of extract tannin is made worth $22, and also a barrel of second quality worth $7.50 per barrel. From the alder one cord will make one barrel worth $20, while from the hemlock bark one cord will make a barrel of first-class extract worth $20.

THE FRANKLINITE ORE SUIT.—In the United States Circuit Court at Trenton, on Tuesday, an interlocutory decree was entered in the case of Moses Taylor against the New Jersey Zinc Company, in favor of the complainant. This decree perpetually enjoins the defendants from the use of franklinite and magnetic ores to be found in Mine Hill, Sussex county, and appoints L. D. Olyphant master to take account of what has been used.

THE FREIGHT ON LAKE SUPERIOR IRON ORE.—A recent letter from Cleveland to a prominent vessel man in Milwaukee states that $1.40 per ton has been freely offered on iron ore from Marquette to Cleveland, without finding takers, as carriers anticipate a low stage of water in the Sault Canal and river the coming season, and are loath to contract at a barely remunerative rate with the prospect of serious inroads on capacity from the cause mentioned. The amount of ore to be carried from Lake Superior during the coming season is estimated at upwards of 1,000,000 tons.

UTAH FEBRUARY BULLION PRODUCT.—The following is the production and shipment of the Utah mines for the month of February:

	Production.		Shipment.
Lead and silver ore	20.329 955 lbs.	Silver ore	2,598,923 lbs.
Silver ore	5,642,970 "	Copper ore	646,203 "
Copper ore	646,263 "	Salt	56,000 "
	Shipment.	Silver bullion	$96,332 76
Base bullion	4,065.990 lbs.	Gold bullion	22,500 00

In all the mining camps business is lively, and several important sales have been made in Bingham.—*Mining Review.*

EMPLOYMENT OF CONVICTS IN TROY (NEW YORK) IRON WORKS.—The employment of convict labor has been forced upon the iron manufacturers of Troy and Albany, and 150 of the Sing Sing convicts are at work on a five years contract. The Ohio prison authorities have been requested to accept a similar contract by a large Albany firm, and if they should accept, the strikers, several thousand strong, who refused to work at reduced wages, will find themselves in a pitiable condition. The companies claim justification for their act because two of their new men have been shot in the streets, and their business has been interfered with by order of the Union to which the strikers belong. The employment of convicts will be resisted by the strikers, with an attempt to secure legislation forbidding it. This is the busy time with the manufacturers, and but little sympathy is felt for the strikers.

DETECTING LEAKS IN TUYERES.—In a letter suggested by a recent discussion on "Spray Tuyeres," in which the difficulty of telling when they are leaking is urged against coil tuyeres, Messrs. Atkins Brothers, of Pottsville, Pennsylvania, say: "We have had a plan in use several years, which we have never known to fail, and it may be of interest to some of your readers. When the blast is off we take a rod of small round iron which will reach to the nose of the tuyeres and run it in the plug hole. If the tuyere is leaking the rod will always show damp, even when the coil is leaking on the outside. This plan is very little trouble, and we have always found it sure."

EXTRACTING ZINC FROM ORES.—(J. H. Johnson.—Dated July 11, 1876).—The principal object is to save fuel and labor by making the process of reduction continuous, and dispensing with muffles, thus generating and using heat where required instead of passing it through walls of clay. The process consists of, first, the reduction of the metal in the form of a gas. Secondly, the protection of metallic vapor from re-oxidation. Thirdly, the condensation of metallic vapor to a liquid form. Fourthly, the removal of the residue of the ore and ashes of the fuel. These operations are described as also a condenser and furnace specially designed to carry out these operations.—*The Engineer.*

FORMATION OF MINERALS.—Hartley has made further examinations of the liquids contained in mineral cavities. He finds that the liquid carbon dioxide present varies considerably—from 27·27° to 33·7° C.—in its critical point in different mineral specimens, often varying in different cavities in the same mineral specimen. The presence of this substance in sapphire and topaz leads him to the supposition that these minerals may have been formed by the action of aluminium fluoride or chloride upon calcium carbonate at high pressures, producing alumina and carbon dioxide. Where water is also present in the cavity it would seem that the reaction had taken place in presence of moisture. As to the diamond, the author thinks that this mineral is the result of the action of reducing agents upon very highly compressed carbon dioxide at temperatures above its critical point—a condition of things which suggests a new direction for speculation and experiment.—*Harper's Magazine.*

AT a recent meeting of the Dresdner Gewerbeverein a communication was read by Mr. Hermann, engineer for the Siemens'Glass Factory, in which he explained that their celebrated hard glass was formed under hydraulic or other pressure which gave the desired hardness independent of any tempering. By means of this process larger glass panes can be formed than was possible before. The glass is stronger than the tempered glass in the proportion of 5 to 3. The fracture is fibrous, not crystalline like the ordinary glass. At an examination instituted by the "Gewerbeverein," a lead bullet weighing 120 grains was dropped upon plates of ordinary and pressed glass, supported at the four corners. The ordinary glass was fractured by a fall of the bullet from a height of 300 millimetres, while the pressed pane fractured at a height of 2 000 millimeters. A second specimen of the latter was subjected to a fall of 3,000 millimeters without breaking.

AN IMPORTANT ORDER AFFECTING THE GERMAN IRON INDUSTRY.—London, March 29.—A special dispatch from Berlin to the *Times* has the following: 'By an order of the Russian Government all locomotive and rolling stock purchased by Russian railways must henceforth be manufactured in Russia. This is another heavy blow to German industry. To enable the railways to obtain locomotives and carriages in Russia the Government will allow the materials to be imported duty free, and will pay premiums and subsidies to Russian manufacturers. The decree, which will be promulgated in a few days seems at present applicable to new companies only; but to be gradually entended to existing companies, as home manufacturers develop their works, and can supply the demand."

The Duty on Iron Goods.—Berlin, March 27.—Members of all political parties have introduced into the Reichstag a bill reimposing a duty of 9½ per cwt. on every description of iron goods.

FURNACES FOR MAKING CHROMATES.—(J. Mactear.—Dated July 10, 1876).—This relates to horizontal circular revolving pan furnaces used for the decomposition of chrome ores, and consists in providing for the withdrawal of the charges of material down through the center of the furnace bottom. The discharge opening and closing valve consists of cylindrical aperture through the bottom and lining, a similar but larger opening being also formed in the roof, and of an iron cylinder jacketed with fire-clay which, resting on the bottom, closes the discharge aperture. The fire gases are led into the furnace space between the revolving bottom and roof through openings at one side by two flues, separated a short distance from each other, stirring apparatus being arranged in that part of the furnace space between the two exit flues. The stirring apparatus described consists of an arrangement in which a row of vertical spindles in a radial plane are carried in a frame, fitted so that it can be lowered or raised by the spindles revolving in opposite directions and carrying prongs at their lower ends, and the circles described by these intersecting each other in the stirred material.—*The Engineer.*

PREHISTORIC MICA MINING.—In a paper read before the New York Academy of Sciences by A. A. Julien, on prehistoric remains in Western North Carolina, a minute delineation was made of an extensive series of ancient excavations extending from Mitchell county southward into Georgia. These cuttings were evidently executed for the purpose of mining for mica and steatite—an industry still actively prosecuted in the region. The coarse granite strata containing the mica are divided into soft and hard bands, which have influenced the character of the mining both in prehistoric and present times. The ancient workings have been discovered in the soil veins, and consist of two classes. In one deep shafts have been found, sometimes containing tools; and these are ascribed to the Spaniards or to still later adventurers. The other class consists of open excavations, occasionally connected with small tunnels; and these are pronounced undoubtedly of prehistoric origin. Ashes have been discovered in some of the mines, showing the use of fire, as in the tunnels of Lake Superior mines. From appearances it is judged that vast quantities of mica have been taken out in prehistoric times; and it is considered that in these mines the source has been discovered of the mica plates extensively used in tombs of the Mound Builders of the Mississippi Valley.

AN EIGHT YEARS COMPARISON OF OUR EXPORT AND IMPORT TRADE.—The *New York Times* of the 27th inst. contains the following interesting table, giving a comparison of imports with exports during the past eight years—in one case with specie included in both, and in the other with specie deducted from both—the figures given being the excess of imports or exports respectively in each year:

	Specie Included		Specie Excluded	
	Imports.	Exports.	Imports.	Exports.
1876	....	$185,884,145	....	$164,009,077
1875	....	64,464 806	....	1,937,241
1874	....	63,190,035	....	7,716,764
1873	$22,545,047	....	$55,608,696	....
1872	118,875,561	....	194 813,195	....
1871	52,122,956	....	112,759,011	....
1870	2,256,776	....	57,602,131	....
1869	69.692,422	....	101,589 986	....

This table shows an extraordinary change in the trade movement, which, we incline to think, is not equaled in commercial history. The same authority predicts that the excess of the exports of the United States for the fiscal year ending with June next will amount to $200,000,000.

MINERS' WAGES IN THE WYOMING REGION PA.—The *Scranton Republican* says: "In instance that miners receive very fair pay, we are permitted to give the annexed from the January rolls of the Hartford mines: A gang of eighty-seven miners were employed eleven days, three-quarter time, and earned the gross amount of $5,551.90. Out of this they paid $1,970.64 for labor, and $936.75 for supplies, leaving as their net earnings $2,644.51. This would be $30.39 for each miner, an average of $2.76 for each three-quarters of a day. Eleven gangway men earned the gross amount of $1,235.48, out of which they paid they paid $556.86 for labor, and $210.95 for supplies,

leaving as the net amount $467.67. The amount for each miner was $42.69, and the rate for each three-quarters of a day $3.88. These figures cannot be contradicted, and the cry of low pay falls to the ground before them."

Since the date of this there has been made a reduction of from 12 to 15 per cent., but even that would leave fair wages to the miner if he could secure steady work. It is not so much the rate of wages that is too low, but the fact that the men cannot get work more than half the time. It is the laborer, not the miner, who has to suffer. His day's wages are very much lower than those of the miner—in some cases not over $1 per day—and yet he cannot find steady employment.—[Ed. E & M. J.

ONE of the most curious but insufficiently substantiated inferences drawn by some of the geologists who have devoted attention to the chemical metamorphoses which the rocks composing the crust of the earth are subject to, is the conclusion that the earth is gradually losing its water, or drying up. It is generally assumed that the evaporation of the water from the surface of our oceans, lakes, rivers, etc., is practically balanced by the various forms of precipitation, rain, snow, hail, etc., from the clouds, by which it finds its way again to the earth. This is strictly true in the sense that not a particle of water passes beyond the limits of our atmosphere, and that all that finds its way into the atmosphere by evaporation sooner or later is returned again. Nevertheless, the water supply of our earth is slowly but steadily diminishing. It is not destroyed, but is so modified as to be no longer available for the sustenance of animal or vegetable life, since it is absorbed and bound up in the rocks. This disappearance of water is to be accounted for partly by mechanical absorption, partly by the hydration or binding of water, which is generally one of the phenomena attending the superficial weathering of the rocks, and partly by the crystallization and re-crystallization of the constituents of many of the rocks, and the extensive chemical changes going on at unknown depths within the bowels of the earth, as manifested in the phenomena of volcanoes. In the course of time, though, happily, many ages from the present, the combined result of these several causes of desiccation must be the complete absorption of all the water, and its disappearance from the surface of the earth. According to the *Polytechnic Review*, the estimate has been made that about one-seventeenth of the original quantity of water the earth was provided with has already been bound up in the rocks, or absorbed beyond the possible reach of the organisms living upon her surface.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending March 24.

Tons of 2,240 lb.	1877. Week.	1877. Year.*	1876. Week.	1876. Year.*
Wyoming Region.				
D. and H. Canal Co.....	36,281	425,648	16,998	289,040
D. L. and W. RR. Co.. .	37,165	421,899	10,100	222,642
Penn. Coal Co	25,574	197,094	12,529	191,788
L. V. RR. Co...	10,489	202,548	20,879	153,105
P. and N. Y. RR Co....	1,084	10,128	26	3,978
C. RR. of N. J..	12,190	249,884	730	117,475
	122,783	1,507,201	61,262	978,028
Lehigh Region.				
L. V. RR. Co.....	46,538	503,734	54,414	299,014
C. RR. of N. J.....	22,418	240,597	6,412	148,450
D. H. and W. B. RR.....	91	4,359	648	8,295
	69,047	748,740	61,474	455,759
Schuylkill Region.				
P. and R. R. RR. Co.....	103,585	854,360	27,416	332,781
Shamokin & Lykens Val.	6,232	79,402	7,076	47,224
	109,617	933,762	34,492	380,005
Sullivan Region.				
Sul. and Erie RR. Co....	197	2,799	1,124	13,251
Total.....	301,644	3,192,502	138,352	1,827,043
Increase.....	143,292	1,365,459	—	—
Decrease.....	—	—	—	—

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent. of the whole production.

Receipts of Coal at Boston, for the week ending March 23, and years from Jan. 1.

Tons of 2,240 lb.	1877. Week.	1877. Year.	1876. Week.	1876. Year.
From				
Alexandria and Georgetown	—	1,298	—	4 162
Philadelphia.....	9,180	60,359	4,872	38,310
Baltimore	1,000	16,602	966	16,478
Other places...	4,612	39,733	1,970	33,540
Great Britain.....	—	707	—	1,806
Nova Scotia....	644	644	—	199
Total.....	15,436	119,343	7,808	94,495

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Piedmont Railroads amounts to 83,529 tons, as compared with the corresponding period in 1876.

Belvidere Delaware RR. report, for week ending March 24.	Week.	Year 1877.	Year 1876.
Coal for shipment at Coal Port (Trenton)	492	492	4,920
" " " South Amboy....	8,840	117,457	88,440
Coal for distribution.....	3,339	37,140	25,624
Coal for Company's use.....	931	16,580	12,404

Perth Amboy business:

	Tons.
Received for the week.....	15,435
Shipped for the week.....	25,269
On hand March 24.....	143,945

The Exports of Coal from Baltimore for the week ending March 23 were ..... tons, and since Jan. 1st, 6,623 tons, as against 8,636 tons for the corresponding period of 1876.

The Production of Coke for the week ending March 14.

Tons of 2000 lb.	Week.	Year.
West Penn. RR.....	740	18,456
Southwest Penn. RR.....	13,125	128,772
Penn. & Westmoreland Region, Penn. RR.	1,322	17,130
Pittsburgh, Penn. RR.....	1,883	32,996
Total.....	17,070	197,354

The Production of Bituminous Coal for the week ending March 24 was as follows:

Tons of 2,000 lb., except where otherwise designated.

Cumberland Region, Md.	Week, Tons.	Year, Tons.
Tons of 2,240 lb.....	17,334	128,549
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb.....	5,394	87,192
Broad Top Region, Pa.		
Huntingdon and Broad Top RR.....	3,215	32,517
*East Broad Top.....	1,119	9,455
Clearfield Region, Pa.		
*Snow Shoe.....	874	11,141
*Tyrone and Clearfield.....	22,000	253,906
Allegheny Region, Pa.		
*Pennsylvania RR.....	5,327	40,059
Pittsburgh Region, Pa.		
*West Penn. RR.....	3,038	38,971
*Southwest Penn. RR.....	846	12,713
*Penn. & Westmoreland gas coal, Pa. RR.	12,653	175,197
*Pennsylvania RR.....	7,392	77,405

*For the week ending March 14.

COAL TRADE REVIEW.

NEW YORK, FRIDAY EVENING, March 30, 1877.

Anthracite.

On Wednesday the Delaware, Lackawanna & Western Railroad Company sold at auction 100,000 tons of Scranton coal. The following were the quantities of the several sizes sold, and the average prices received, comparison being made with the prices received by this company at its sale in February:

	Tons.	March 28.	Feb. 28.
Steamer.....	7,000	$2 75	$2 82¼
Grate.....	28,000	2 72	2 77½
Egg	15,000	2 82½	2 92¾
Stove	35,000	3 22	3 49¾
Chestnut.....	15,000	2 81	3 18
	100,000		

These figures show a decline at the last sale, as compared with the previous one, as follows: On steamer, 7c.; grate, 5c.; egg, 10c.; stove, 28c.; and chestnut, 37c. Although this sale indicates about the true position of the market, yet there are those who think, and not perhaps without some shadow of cause, that there was a little artificial stimulus applied to secure even these at this sale. It is evident, however, that the sale was intended to meet the market, and if bolstering were done, it was only after prices had passed the worst expectations.

Owing to the vast amount of speculation that has lately taken place in the coal-carrying companies' stocks, the meeting of the presidents, which took place at the office of the Delaware & Hudson Canal Company yesterday afternoon, was largely discussed and looked to with much interest. The meeting lasted an hour and a half; all the companies excepting the Pennsylvania Railroad were properly represented, and it is said that the proceedings were quite harmonious; from which, some take hope that a new combination will be formed. Let us see what was done. After considerable discussion, Judge Packer expressed himself willing to become a party to some plan by which the present unsatisfactory condition of the coal trade might be improved, *provided* the plan embraced no illegal proceedings. It was resolved, that in the present depressed condition of the industries of the country the coal companies have no disposition to advance prices beyond a sum sufficient to pay *reasonable* costs and expenses. Messrs. F. B. Gowen, Robt. H. Sayre, and Thos. Dickson were appointed a committee to prepare a plan to improve the trade generally, and to advance prices at tide-water at least 50c. per ton, and to report at a meeting to be held next Wednesday.

That there should have been difficulty in getting any gentleman connected with the coal business to promptly approve of this general proposition for the good of the trade, could scarcely have been expected. It is well known that the gentlemen of this committee entirely disagree upon the theory of how a coal combination should be conducted, and owing to the diversity of interests this is not strange. From this cause, if the committee should agree upon a plan, it will still be but a general one, leaving the most knotty questions for further consideration. What has been done thus far amounts to nothing practically, and that before another combination can be formed, the deep rooted distrust which exists among some of the members must be overcome, and the strong prejudices resulting from a sad experience must be removed. It took more than two months for the committee to determine upon the programme which governed the combination of 1876, and it was accepted in a very incomplete form, as though they had given up in despair of being able to arrive at a satisfactory understanding. In all other important contracts that these gentlemen might make, a satisfactory guarantee or penalty in case of non-fulfillment, would be required; and it is just as essential in this case; but, it is well understood by all that the penalty cannot here be legally enforced. There was a penalty specified in the last combination, and if it could have been enforced, would have held the organization together to the end of the season. After this will come up the question of the proportions each shall ship. The Lehigh Valley Railroad Company will certainly claim a larger percentage than was given it last year. Furthermore, Judge Packer objects to doing anything illegal. He has all along contended that he has no right as a common carrier to refuse tonnage to those who ask it. To obviate this, it is proposed to make each of the individual operators on his line a party to the combination, each agreeing to submit to a curtailment of production to be determined by a representative of the Lehigh Valley Railroad Company. But should any one operator, unmindful of his promise, demand transportation for more than his quota, would not Judge Packer be obliged to furnish it?

History in general and the history of the coal trade in particular do not justify the belief that such an arrangement could be other than very short-lived, and we see no special features in this case to interfere with the proverbial repetition of history.

WHAT HAVE THE COMPANIES TO GAIN BY COMBINATION?

Under combination the Reading Company exhausted its resources and credit, and the Lehigh & Wilkes-Barre Coal Company is shown to have lost about 70c. per ton on all the coal it mined; yet these companies are gravely asked to join another combination to secure a repetition of these blessings, and stranger yet, have actually taken part in discussing plans for its establishment. Since the failure of the combination the Reading has steadily pursued the policy, the only correct policy, of increasing its business, even though that has to be done at a temporary sacrifice of profit, and it seems now to be approaching a satisfactory condition.

The Lehigh Valley Company—which owns few mines and looks chiefly to transportation for its profits—with its superior coals and comparative nearness to market, can certainly hold its own in an open competition, and has therefore all to lose and nothing to gain by restricting tonnage.

The Lehigh and Wilkes-Barre Company can doubtless make a much better showing under the policy of unrestricted business than it did under combination, and indeed the fact that the President, Mr Parish, has taken a contract to mine and deliver the coal in the railroad cars at the breakers at $1.20 per ton (not $1.25 as at first reported) shows that this company, even at present prices, would do better than it did under the high prices of the late lamented combination, when its loss is stated to have been 70c. per ton.

The Lackawanna companies, on the other hand, being less favorably situated as regards tide-water freights, and having some other points of disadvantage, would doubtless be temporarily benefitted by the higher prices which would be the object of restricted production.

At least these companies profitted most by the last Combination, while the Pennsylvania Coal Company with no desire to greatly increase its business, and with its proportion under the programme much nearer its productive capacity than that of some of the other companies, would doubtless be largely benefitted by such an agreement—in fact, it alone would probably find a permanent benefit in such an arrangement, for we take it as almost an axiom that any artificial regulation of the trade for the maintenance of high prices, would, by reducing consumption and diverting trade, be ultimately injurious to all the companies.

It is very evident that the chief object sought by those so desirous of combination is to restrict the Reading, the Wilkes-Barre, and the Lehigh Valley companies, the former of which is making very strenuous and successful efforts to open markets and increase business, while the financial status of the Wilkes-Barre makes it a most formidable rival.

How little faith those who took part in the meeting

have in the realization of their combination scheme is apparent from the following facts: Immediately after the meeting, the Delaware & Hudson Canal Company reduced its prices from 5c. to 25c per ton, quoting now as follows:

Furnace lump	$2 90	Egg	$2 95
Steamer "	2 90	Stove	3 35
Grate	2 90	Chestnut	3 25

It, however, fixed the freight charge from Rondout to this city making it 50c. instead of 40c. at Weehawken.

The Lehigh Valley Railroad Company has reduced its freight rate from Penn Haven to Amboy, from $1.26 to $1 per ton, which figure includes shipping charges. Why this haste to reduce prices and freights if we are on the eve of combination and higher rates all round?

There is another view of these repeated efforts to make the public believe in the organization of a new combination to which we regret having to refer.

It is a public secret that the officers of some of the companies are speculating largely in coal stocks, and use is discretely made of every meeting and proposition for or against combination, to affect the value of stocks. Even the brokers are beginning to object to playing at this game with gentlemen whose positions are equivalent to the use of loaded dice.

The production during the week ending March 24 was 301,644 tons; the corresponding week of 1876, 158,352 tons; and the week ending March 17, 292,663 tons. The total production from January 1 to March 24 was 3.192,502 tons, as against 1,827,043 tons for the corresponding period of last year, showing an increase on this year's business of 1.365 459 tons. It will be observed, however, that of this increase 521,579 tons has been secured by the Philadelphia & Reading Railroad Company, which has made shipments this year 160 per cent. in excess of the like period of 1876

Bituminous.

The Baltimore and Ohio Railroad Company has issued the following circular, which took effect March 26.

Rates of coal tariff, per ton of 2,000 lb., for transportation of semi-bituminous coal in car-loads:

From Cumberland to Baltimore City stations, viz.:	
Locust Point, Camden and Mount Clare	$1 87
From Cumberland to Locust Point shipping wharves	1 62
From Piedmont to Baltimore City stations, viz.:	
Locust Point, Camden and Mount Clare	2 15
From Piedmont to Locust Point wharves	1 90
From Newburg to Baltimore City stations, viz.:	
Locust Point, Camden and Mount Clare	3 82
From Newburg to Locust Point wharves	3 82
From Fairmont and Clarksburg to Baltimore City stations, viz.: Locust Point, Camden and Mount Clare	4 32
From Fairmont to Locust Point wharves	4 32

For street delivery, at private yards, switches, etc., at Baltimore, 30 cents per ton will be added to the station rate.

For delivery to stations of other roads in Baltimore for transportation thereon—*when allowed*, 50 cents per ton added to the Baltimore and Ohio station rate.

For all points on the Locust Point Branch, west of Dobbin & Warfield's shipping wharf, $2 per car will be added to the station rate.

To Washington.—From Cumberland, Piedmont, Newburg, Fairmont and Clarksburg, the rate to Washington will be the same as from these points to Camden station, Baltimore.

Way Rates.—No distance, however short, to or from any point, shall pay less than five dollars per car load.

From Cumberland and Piedmont - Eastward or Westward.—For the first 50 miles or less, 2¾ cents per ton per mile. For distances between 50 and 100 miles, 2¼ cents per ton per mile; for distances over 100 miles, 1¾ cents per ton per mile until it reaches the Baltimore station rate, which it will not exceed to any point, provided that not less than $1.37 per ton shall be charged for any distance over fifty miles, nor less than the Baltimore station rate for any distance over 100 miles.

From Newburg, Clarksburg and Fairmont or other way points on the Main Stem or N. W. Va. Road, 2½ cents per ton per mile westward, and eastward as far as Piedmont, then add the rates from Piedmont east until Baltimore station rate from Newburg or Fairmont is reached, provided that no car load pays less than $5 for any distance.

The business from the Cumberland region has steadily decreased as compared with 1876, being (since January 1) 83,529 tons less than in the corresponding period of the last year.

The Clearfield shipments are not so large as they were a few weeks ago, but are still greater than a year ago, showing an increase since January 1, as compared with the corresponding period of 1876, of over 48 per cent. Freight rates being about settled, we may now anticipate learning of some important contracts at an early day.

Gas Coals.—The Chesapeake & Ohio Railroad Company has determined upon $5.65 per ton for its coal delivered in this city, as compared with $6, the price fixed by combination between the Pennsylvania and Baltimore & Ohio Railroad Companies. It is hardly necessary to state that the business would be almost entirely confined to Provincial and Chesapeake & Ohio Railroad Companies coals on these terms, were it not for the interests of influential holders of gas stocks in some of the gas coal mines.

Circular No. 7
PHILADELPHIA & READING RR. Co.,
PHILADELPHIA, March 21, 1877.

The following regulations relative to the payment of drawbacks on coal sold under contract and shipped from Port Richmond or *via* the Schuylkill Canal will be observed:

For Registered Contracts under Circulars Nos. 6 & 8.

1. The shippers must in all cases furnish the undersigned with the original contract or agreement upon which the coal is to be shipped, which will be returned (properly endorsed and numbered) if required, and a copy thereof preserved in this office. These contracts must either be signed by the parties thereto, in person, or, if otherwise signed, the authority for such signature must accompany the contract.

2. The shipper must sign a certificate, to be endorsed in writing upon the contract, that he has no interest whatever in the coal so sold beyond the price named in the contract, that the coal is not to be sold by the contractor for or on his account, and that no commission or other pecuniary consideration whatever is to be received by him, or on his account, from the contractor, vendee, or consignee, other than the said contract price.

3. The master of the vessel must sign a bill of lading for each cargo shipped from Port Richmond, in the book kept by the general agent of this company at that place.

4. The shipper will present his bill for drawbacks to the comptroller of this company on each Tuesday, made out on blanks to be furnished by this company, and if found correct they will be paid on the following Tuesday.

5. The following certificate must be endorsed upon each bill: "We hereby certify that the above shipments of coal have been received by the consignees named above, for their own use; that we have no interest whatever in the said coal other than the contract prices, and that the prices given above are the contract prices at which the same was sold, and that neither directly nor indirectly have we received, nor will we receive, any greater price or other compensation for the said coal than above named." This certificate takes the place of the bills of lading heretofore required.

For General Shipments under Circulars Nos. 5 and 7.

1. The shipper will present his bill for drawbacks to the comptroller of this company on each Tuesday, made out on blanks to be furnished by this company, upon which blanks the prices at which each cargo was sold must be clearly stated. If found correct the bills will be paid on the following Tuesday.

2. The following certificate must be endorsed upon each bill: "We hereby certify that the above shipments of coal have been received by the consignees, and that we have no interest whatever in the said coal, other than the prices given above, and that the prices above given are the correct prices at which said coal was sold, and that neither directly nor indirectly have we received, nor will we receive, any greater price or other compensation for the said coal than that above named."

If the coal is sold to be delivered at any of the places below named, on the Hudson River or on Long Island Sound, the following are the maximum amounts that can be deducted from the price at which the coal is sold before the division is made to ascertain the price regulating the charges for freight and tolls.

ON THE HUDSON RIVER.

	Cts. per ton.		Cts. per ton.
Manhattanville	7	Verplanck's Point	15
Spuyten Duyvel	8	Peekskill	15
Yonkers	8	West Point	16
Hastings	10	Cold Spring	16
Piermont	11	Newburgh	16
Dobbs' Ferry	11	Poughkeepsie	17
Nyack	14	Rondout	17
Tarrytown	14	Catskill (min. 540 p. b't)	22
Sing Sing	14	Hudson, " " "	22
Croton Landing	15	Albany	17
Haverstraw	15	Troy	24

ON LONG ISLAND SOUND.

On a minimum of 210 tons per boat.

	Per boat.		Cts. per ton.
Harlem	$16	South Norwalk	20
Mott Haven	16	Bridgeport	17
Port Morris	18	New Haven	17
West Farms, mouth of Creek	25	Derby ($50 per boat extra)	17
West Farms	35	Southport	25
West Chester	30	Westport	25
College Point	25	Milford	25
Flushing	25	Branford	30
White Stone	27	New London	32
E. Chester Town Dock	60	Saybrook	30
New Rochelle	40	Middletown	50
Glen Cove	40	Norwich	38
Mamaroneck	60	Hartford	52
Port Chester	60	Stonington	38
Greenwich	60	Mystic	38
Stamford	60		
Darien	60		

If any cargo fails to reach its destination from any cause whatever, and is reconsigned, such reconsignment will be considered a new shipment, and the drawbacks will be readjusted under rates current at time of reconsignment.

DAVID J. BROWN, Sec'y.

PHILADELPHIA & READING RR. Co.,
PHILADELPHIA, March 24, 1877.

Circular No. 10, of March 16, 1877, imposing a penalty upon cars not unloaded at Port Richmond on day of delivery, will take effect on and after Monday, April 2, instead of March 26, as mentioned herein.

New York and Philadelphia.

Wholesale Prices of Anthracite Coal f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
‡Lackawanna and Scranton at Hoboken and Rondout	2 90	2 90	2 90	2 95	3 35	3 25
Wilkesbarre at Port Johnston	3 00	3 00	3 00	3 10	3 65	3 25
Plymouth, R. A.	....	....	3 00	3 10	3 75	3 35
Susque: Coal Co., (S. H. Brown & Co.,) at Amboy	2 80	2 80	2 80	2 95	3 50	3 20
Kingston at Hoboken	2 85	2 85	2 90	3 00	3 60	3 25
Pittston at Newburgh:						
A. S. Swords	2 80	2 80	2 85	2 85	3 30	3 25
Penn. Coal Co.	3 10	3 10	3 10	3 20	3 60	3 25
Lehigh Coals.						
Old Company at Port Johnston	3 75	....	3 25	3 25	3 65	3 25
Old Company's Room Run "	3 75	....	3 25	3 25	3 65	3 25
Sugar Loaf, Hobok. & Amb. "	3 75	....	3 25	3 25	3 65	3 25
Lehigh Coal Exchange "	3 75	....	3 25	3 25	3 75	3 50
Honey Brook Lehigh	3 75	....	3 25	3 25	3 65	3 25
Beaver Meadow at South Amboy	3 75	....	3 25	3 25	3 65	3 25
Mount Pleasant at Hoboken	3 75	....	3 15	3 15	3 50	3 30
Cross Creek at Elizabethport	3 75	....	3 25	3 25	3 75	3 25
Schuylkill Coals at Port Richmond, Philadelphia.						
Schuylkill white ash	2 75	2 75	2 60	2 65	3 25	2 75
Schuylkill red ash	....	....	....	2 75	3 35	2 75
Lorberry	....	....	3 60	3 60	3 60	3 00
Lykens Valley	....	....	4 15	4 15	4 15	3 30

‡ Boats towed by the D. & H. C. Co. at its expense to and from New York harbor.

Per ton.

Freight from Hoboken and Weehawken to New York ..... 35c.
" " Elizabethport & Port Johnston to N. Y. ..... 35c.
" " South Amboy to New York. ..... 35c.

Freight by the boats of the companies from Hoboken, Rondout, Port Johnston, Weehawken, South Amboy and Perth Amboy to New York City and vicinity 50c.

Pittston coal at New York or Brooklyn delivered by Penn. Coal Co.'s boats 60c. per ton additional.

Lackawanna coal delivered to carts in New York or Brooklyn, 50 cents per ton additional.

Wholesale Prices of Bituminous Coal.

Manufacturing and Steam Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Cumberland, at Georgetown and Alexandria, Va.	3 25@....	4 65
Cumberland, at Baltimore	3 65@3 70	5 00
Clearfield f.o.b. Canton, Baltimore	3 50@....	5 00

Pennsylvania Semi-Bituminous Coals

At the mines, per 2,000 lb., 90c.@$1 f.o.b, at Greenwich, Phila., for Eastern and foreign shipments, per 2240 lb. $3 25@3 35 for Sound ports, 3 50@3 65, f.o.b., at South Amboy, N. J., per 2,240 lb., $4 10@4 75. Discharged, in New York, per 2,240 lb., $5 00 @5 15.

Foreign Gas Coals.

	Sterling.	Am. cur cy.
Newcastle, at Newcastle-on-Tyne	9/6@11/	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	42/	18 00
" Gas Cannel "	28/	13@14
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S.	1 75	4 75
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 50	4 25
Lingan, at Lingan Bay	1 75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$3 90	$4 20	$3 90
Lackawanna coal, in yard	3 50	4 00	3 90
Wilkes-Barre, delivered	5 00	5 30	4 60
Lehigh & Locust Mountain, del'd	5 50	5 50	5 00
Schuylkill Red Ash, del'd	5 25	5 50	4 75

The Cost of delivery for Pittston and Lackawanna coal ranges from 40 cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb.	$18 00
Liverpool House Cannel " " "	.... 18 00
American " " "	.... 11 00
Cannelton Block, or splint, " " "	.... 10 00
American Orrel " " "	....11@14
Red Bank Cannel " " "	.... 10 00
Cumberland " " "	.... co

Baltimore, Md. March 27, 1877.

Specially Reported by Messrs. E. STABLER & Co.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Boston" Vein, and Plymouth White Ash.

In cars at depot.		In cars at depot.	
Lump	$3 85	Egg	$4 10
Steamboat	4 10	Stove	4 60
Broken	4 10	Nut	4 10

Shamokin, red or white ash.

Egg	4 30	Stove	4 60

Lykens Valley, red ash,

Egg and stove	5 35

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2240 lb. ..... $6 00@7 50

BITUMINOUS.

George's Creek, Cumberland f. o. b. at Locust Point	3 75@4 00
West Virginia Gas f. o. b. at Locust Point	4 50
Youghiogheny Gas, f. o. b. at Locust Point	4 50
Swanton	4 00

Boston, Mass. March 24, 1877.

Coal continues to rule low, but a trifle better feeling has been manifested since the auction sale. This is looked upon as a *bona fide* sale, and the prices are better than had been anticipated, considering the approach of summer and the large production at present. Stove-sizes dragged more than any other kind. The strikes in the Cumberland and Clearfield region have ended, and all the others have proved abortive.

We quote Boston wholesale price as follows:

Anthracite, broken	4.50@4.75	Cannel, English	16.00
do egg	4.50@4.75	Do. Buckeye	10.00
do stove	5.00@5.25	Lingan	4.75@5.00
Cumberland	5.75	Pictou	5.50
Clearfield	5.25	Penn	6.25
Westmoreland	5.50	Youghiogheny	5.00@6.00
Caledonia	4.50@4 75		

—*Commercial Bulletin.*

Chicago, Ill. March 27, 1877.

Specially reported by Messrs. RENO & LITTLE.

Lackawanna Stove	$8 00	Erie and Brier Hill	$6 00
" Chestnut	8 00	Wilmington & Ill.	3 50@ 4 25
" Grate & Egg	7 50	Blossburgh	7 00

Cleveland, O. March 27, 1877.

Specially reported by Messrs. LAMBIE & BATES.
Per ton of 2000 lb. f. o. b. vessels

WHOLESALE.

Briar Hill (Church Hill)	3 50
" " No. 2 Grades	3 35@3 40
Straitsville Lower Vein	2 90
Hocking Valley	2 90
Massillon	2 90
Mineral Ridge (Cambria Mine)	2 90
Tuscarawas Valley	2 40
Columbiana	2 40
Nut coal, various grades	2 20@2 50
Screenings, " "	1 35@1 75
Youghiogheny gas coals	3 75@3 85

The following are the prices established by the Coal Exchange until further notice:

RETAIL.

	1 to 10 tons.	10 tons upw'd.
Brier Hill lump	$3 25	$4 00
" " nut	4 75	3 50
Massillon and Mineral Ridge lump	4 00	3 75
" " " " nut	3 75	3 50
Straitsville Lower Vein, Hocking & Shawnee, l'p.	3 60	3 35
" " " " nut	3 40	3 15
Del Carbo lump	3 75	3 50
" " nut	3 50	3 25
Rich Hill lump	3 50	3 35
" " nut	3 25	3 00
Columbiana, lump	3 25	3 00
" nut	2 75	2 50
Lacka'a., Wilkesbarre and Pittston egg and grate,	7 00	6 75
" " " stove	7 50	7 25
" " " chestnut	7 25	7 00

Lehigh to be $1 25 per ton higher.
All sales to be strictly cash with order or C. O. D.

Louisville, Ky. March 27, 1877.

Specially reported by Messrs. BYRNE & SPEED.

WHOLESALE.

	per bushel		per bushel
Pittsburg	6½c.	Pine Hill	—
Raymond City	6½c.	Kentucky	7c.

RETAIL.

	per bushel		per bushel
Pittsburgh	10c.	Peytona Cannel	18c.
Raymond City	10c.	Buckeye "	
Pine Hill	13c.	City-made Coke	8c.
Kentucky	9c.	Anth., per ton, $1c 00 to 10 50	

Screened Pittsburgh per load	$3 50
Screened Raymond City	2 50
Pine Hill (Kentucky)	2 25
Cannel	4 50
City-made Coke	4 00

Milwaukee, Wis. March 27, 1877.

Specially reported by Messrs. R. P. ELMORE & Co.
Retail price per ton of 2000 lb.

Lehigh Lump	$ 8 00	Briar Hill, select	$7 00
Lehigh Prepared	9 00	Blossburgh	7 00
Lackawanna (all sizes)	8 00	Cannel	6 00
Pittston	8 00	Pittsburgh	6 50
Scranton	8 00	Oak Hill	4 00
		Steam coal	@6 00

New Orleans, La. March 26, 1877.

Specially Reported by Messrs. C. A. MILTENBERGER & Co.

Pittsburg coal, wholesale, by boat-load, per bbl	40@42½c.
" steamboats, per bbl	65c.
" to manufacturers, per bbl	65c.
" to families	85c.
" shipments, per hhd	$7 00
Anthracite, wholesale, per ton	7@8 00
" retail, "	11 00
Virginia Cannel, retail, per bbl	1 25
Scotch " "	
Mt. Carbon, wholesale, per bbl	
" " retail, "	
St. Bernard wholesale, per bbl	—c.
" steamboat	60c.
" retail "	75c.

Pittston, Pa. March 27, 1877.

Pennsylvania Coal Company's Coal in yard, ton of 2000 lb.
Retail.

Lump, Egg and Stove	$2 25
Chestnut	2 00
Pea	1 00

Delivered, fifty cents per ton additional

Richmond, Va. March 27, 1877.

Specially reported by S. H. HAWES, Dealer in Coal.
Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$9 00	New River Bituminous,	$4 25
Coalburgh Splint	5 70	Clover Hill Coal	3 50
Lewiston "	5 70	James River Bitum	3 25
Kanawha Gas coal	4 90	" " Carbonite,	5 00

San Francisco, Cal.

From the *Commercial Herald*, March 22, 1877.

COAL—Imports from Jan. 1st to March 1:

	Tons.		Tons.
Anthracite	3,971	Mt. Diablo 2 mos	10,051
Australian	16,590	Vancouver Island	19,878
Coos Bay	6,897	Rocky Mountain	43
Cumberland	4,196	Seattle	23,280
English	11,017	Bellingham Bay	1,850

Last week we made reference to the shipment of 2,000 tons anthracite at Philadelphia for this city per ship *De Costa* at $10 per ton freight. It is not stated in the *Record* whether it is Lehigh or Pittston; in either case the venture does not promise well. Our foundrymen are now using largely of coke, the present spot price of which is $15@16. The same to arrive from Sydney is offered at $13@13.50, and by many coke is preferred to Lehigh. The ship *Loch Cree* from Sydney is to hand with 900 tons shale for the Gas Company and 242 tons coal. At present the market for all sorts of coal is very sluggish, and foreign cargoes for forward delivery are offered at ruinously low prices. Supplies of Nanaimo for the Pacific Mail Company, and Seattle for the Central Pacific, are of considerable importance, while Wellington, by reason of its great cleanliness, is a growing favorite for all household durposes. Bellingham Bay, Coos Bay, Black Diamond and Mt. Diablo coals arrive freely, all selling at low prices from the wharf, say for cargo lots $7.75@$8. Vancouver Island coals, $8@$9 by the cargo; Scotch and English steam, $7.50@$8.

St. Louis, Mo. March 27, 1877.

Reported by JAS. J. SYLVESTER, Secretary of the Anthracite Coal Association.
Retail prices, delivered. Ton of 2,000 lb.

ANTHRACITE. per ton.

Lackawanna	$9 00@10 00	Schuylkill	9 00@10 00
Wilkes-Barre	9 00@10 00	Lehigh	10 00@10 50

BITUMINOUS.

Blossburg	9 00	Big Meadow	3 00
Pittsburg	4 50	Illinois Coals	2 50@3 00
Indiana Block	4 00	Connellsville Coke	3 50

Toledo, Ohio. March 27, 1877.

Specially reported by Messrs. GOSLINE & BARBOUR.
We quote as follows for retail delivery:
Ton of 2,000 lb.

Lackawanna lump	$6 75	Lehigh lump	$7 75
" egg	6 75	" egg	7 75
" stove	7 00	" stove	8 00
" chestnut	6 75	" chestnut	7 75

Soft Coal.

Hocking lump	4 00	Brier Hill	5 75
" nut	4 00	Blossburg	8 00
Willow Bank lump	4 50	Cumberland	8 00
" nut	4 00		

Hamilton, Ont. March 27, 1876.

Specially reported by H. BARNARD, Dealer in Coal.
Stocks are low, and will all be sold out this season.
Retail, per ton of 2,000 lb.

Grate	$6 00	Smithing	6 00
Egg	6 00	Bituminous, retail	6 00
Stove	6 50	" steam	4 00
Nut	6 50	Coke	6 75
Lehigh Lump	6 50		

Montreal, Canada. March 27, 1877.

Specially reported by Messrs. ROBERT C. ADAMS & Co.
Wholesale per ton of 2240 lb.

Scotch Steam	$5 00	Cape Breton Steam	
Pictou "	4 75	Newcastle Smiths,	
Anthracite at retail, per 2000 lb., delivered.			
Egg	$6 50	Chestnut	
Stove	7 00		

Freights

Representing the latest actual charters up to March. 29,
Per Ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore.	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	....	....	....
Albany	....	....	....	....
Alexandria	....	....	....	....
Amesbury, Mass	....	....	....	....
Bangor, Me	....	....	....	....
Bath, Me	....	....	....	1.15-1.25
Baltimore	65	....	....	....
Boston, Mass	$1 50@1 55	....	....	1.20-1.25
Bridgeport, Ct	90¢	....	....	50
Bristol, R. I	1 15	....	....	80
Brooklyn, N. Y	90	....	....	....
Charlestown, Mass	1 40@1 50	....	....	....
Charleston, S. C	1 25	....	....	....
Darien, Conn	90¢	....	....	....
Fall River	1 25	....	....	80
Gloucester	1 50	....	....	....
Flushing, N. Y	90	....	....	....
Georgetown, D. C	75@80	....	....	....
Hoboken	90	....	....	35
Hudson	....	....	....	....
Jersey City	....	....	....	35
Lynn, Mass	....	....	....	1 37½
Middletown	....	....	....	90
Mystic	....	....	....	....
Newark	....	....	....	....
New Bedford	....	....	....	85
Newburyport	....	....	....	1 40
New Haven	....	....	....	50
New London	....	....	....	65@70
Newport	1 25	....	....	80
New York	90	....	....	35
Norfolk	70@77	....	....	75
Norwalk	90¢	....	....	50
Norwich	1 25	....	....	....
Pawtucket	1 35	....	....	70
Philadelphia	....	....	....	....
Portland	1 25@1 50	....	....	1 25
Portsmouth, N. H	1 60	....	....	1 40
Providence	1 25	....	....	80
Poughkeepsie, N. Y	....	....	....	....
Richmond, Va	....	....	....	....
Rockport, Mass	....	....	....	....
Salem, Mass	....	....	....	....
Savannah, Ga	....	....	....	....
Stamford	....	....	....	60
Stonington	....	....	....	75
Troy	....	....	....	....
West Chester, N. Y	90	....	....	....
Washington	80	....	....	....
Yonkers, N. Y	90	....	....	....

* And discharging and towing. † And discharging. ‡ And towing. $ 30. per bridge extra.

IRON MARKET REVIEW.

New York

FRIDAY EVENING, March 30, 1877.

American Pig.—The business of the week has been very quiet and prices have continued to weaken. We quote sales of about 1,000 tons of Thomas iron in lots on the basis of $20 for No. 1 foundry; 750 tons of No. 1 foundry, at Troy, at $18, and 500 tons of North River No. 1 foundry at $19. Allentown iron is being quoted at $19 for No. 1 foundry, and it is said that the company will start two furnaces next week. There are rumors of sales even lower than any we have yet quoted. We quote No. 1 foundry at $19@$20; No. 2 foundry, $18@$19; and forge, $17@$18. No further particulars have been received with regard to the disposition of the Reading Coal & Iron Company's iron.

Scotch Pig.—The business has been confined to small lots. Owing to lack of demand and lower prices in Glasgow, quotations here are lower and as follows: Eglinton, $24.50; Coltness, $26.25 and Glengarnock nominal at $25@$26.

Rails.—We learn of no transactions in these, and continue to quote iron rails at mills at $33@$37 and steel at $48.50@$50.

Old Rails.—There is no business reported. We quote nominally at $19.

Scrap.—500 tons are reported to have been sold at a private price, supposed to be at $26, which we consider a nominal quotation.

Baltimore, Md. March 28, 1877.

Specially reported by Messrs. R. C. HOFFMAN & Co.

The iron market remains quiet, demand moderate, and prices unchanged. We quote:

Baltimore Charcoal	$29@31	Mottled and White	$16@17 00
Virginia Charcoal	28@32	Charcoal C. B. Blooms	60@62 00
Anthracite No. 1	21@22	" " Pelletts	65@67 00
" No. 2	20@21	Refined Blooms	45@50 00
Anthracite No. 3	19@20		

Boston, Mass. March. 24, 1877.

Pig continues easy under the influence of the weak New York advices and the blowing in of blast furnaces. We quote $23 50@24 for No. 1, $23 for No. 2, and $22@23 for gray forge. Scotch pig is dull. We quote Coltness $28, Glengarnock $26 50, and Eglinton $26. The foreign markets continue easy.

Bar is dull, quoting $47@48 for refined, and $38@39 for common. Nails are in light demand. Rails have quieted down.—*Commercial Bulletin.*

Buffalo, N. Y. March 29, 1877.

Specially reported by Messrs. PALEN & BURNS, 246 Washington Street.
Prices per Gross ton at Buffalo.

ANTHRACITE.

No. 1 Foundry	$23 00@23 50	—4 mos
B 1 "	22 00	—4 "
No. 2 "	21 00	—4 "
Gray Forge	20 50	—4 "

LAKE SUPERIOR CHARCOAL IRONS.

No. 1	$26 75	—4 mos
No. 2	25 75	—4 "
No. 3	25 25	—4 "
No. 4	25 25	—4 "
No. 5	25 75	—4 "
No. 6	26 25	—4 "

AMERICAN SCOTCH—CHERRY VALLEY.

No. 1	$25 50	—4 mos.
B 1	24 00	—4 "
No. 2	23 00	—4 "

One dollar off for cash.

Chattanooga, Tenn. March 27, 1877.

Specially reported by J. F. JAMES. pig iron broker, etc., 233 Market Street.

The market here remains unchanged. Demand equal to the supply, with no material change in prices. There is a great scarcity of standard brands and a very large inquiry for cold short coke mill iron, with little or none on hand at furnaces or in store to meet the demand. I quote as below:

Tenn. Ala. and Ga. Charcoal,	No. 1 foundry	$20@	22
" " " "	No. 2 foundry	19@	20
" " " "	gray forge foundry	16@	17
" " " coke,	No. 1 foundry	20@	21
" " " "	No. 2 foundry	18@	19
" " " "	gray forge foundry	16@	17
Charcoal or Coke, White and Mottled		15@	—
Tennessee, Alabama and Georgia cold-blast car wheel.		22@	28
Old Rails		18@	19
Old car wheels		16@	17
Wrought Scrap, No. 1		17@	—
" " " 2		12@	—
Cast Scrap		10@	—
Muck Bar		32@	33

Iron Ores.

Red Hematite (about 55 per cent. metallic iron), f.o.c. et mines	1 25
Brown Hematite (about 25 per cent. metallic iron)	1 75

Cincinnati, Ohio. March 27, 1877.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Our market is not very active, but prices are firm at quotations:

CHARCOAL.

Hanging Rock, No. 1 Foundry	$25 00@		—4 mos
" No 2, "	24 00@		—4 mos
" Mill	22 00@	23 00	—4 mos
" Soft Silver Gray	21 00@	22 00	—4 mos
Tennessee, No. 1, Foundry	23 00@	23 50	—4 mos
Tennessee, No. 2, "	22 50@	23 00	—4 mos
" Mill	21 00@		—4 mos
Missouri, No. 1, Foundry	22 50@	23 00	—4 mos

STONE COAL.

Ohio, No. 1, Foundry	21 50@22 00	—4 mos	
" No. 2, "	21 00@21 50	—4 mos	
" Soft Silver Grey	20 50@21 00	—4 mos	
Ohio Mill	20 00@21 00	—4 mos	
Missouri, No. 1 Foundry	25 00@	—4 mos	
" No. 2, "	24 00@	—4 mos	
" Mill	21 00@22 00	—4 mos	

CAR-WHEEL.

Hanging Rock, C. B	38 00@43 00	—4 mos	
Tennessee "	28 00@32 00	—4 mos	
Missouri "	30 00@33 00	—4 mos	
Alabama "	28 00@33 00	—4 mos	

BLOOMS.

Charcoal	55 00@ 60 00	—cash

SCRAP IRON.

Cast	50c.@1 00	—cash
Wrought	1 00@1 40	—cash

Cleveland, Ohio. March 27, 1877.

Specially reported by Messrs. C. E. Bingham & Co.

Per gross ton, on four months' time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, Lake Superior Charcoal	26 00@....
No. 2, " " "	25 00@....
No. 1, Anthracite	24 00@....
No 2, "	23 00@....
No. 1, Bituminous	24 00@ ...
No. 2, "	22 00@....
American Scotch, No. 1, Cherry Valley	24 00@....
" " B—1, " "	23 00@....
" " No. 2, " "	22 00@....
No. 1, Massillon	24 00@...
B—1, "	23 00@....
No. 2, "	22 00@....

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal	26 00@...
No. 4 " " "	27 00@....
Nos. 5 and 6 "	27 00@....

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal	26 00@....

FORGE IRON.

No. 1, Gray	21 00@....
White and Mottled	19 00@....

Louisville, Ky. March 27, 1877.

Specially reported by Messrs. George H. Hull & Co.

The demand is not so good as during the early part of the month. Prices are without change.

The usual time, four months, allowed on quotations below.

HOT BLAST—CHARCOAL.

No. 1 Foundry, from Hanging Rock Ores	$25 00@26 00
No. 2 " " "	23 00@24 00
No. 1, Mill, from " "	22 00@22 50
No. 1. Foundry, from Alabama, Georgia and Tennessee ores	21 00@21 50
No. 2, Foundry, from Ala., Geor'a and Tenn. ores	23 00@23 50
No. 1, Mill, from " " " "	21 00@22 00

HOT BLAST—STONE COAL AND COKE.

No. 1, Foundry, from Hanging Rock Ores	23 00@23 50
No. 2, " " " "	21 00@22 00
No. 1, Mill, " " "	21 00@22 00
No. 1, Foundry, from Ala. Ga. and Tenn. Ores	20 00@20 50
No. 2, " " " "	19 50@20 00
No. 1, Mill, " " " "	20 00@21 50
No. 1 Foundry, from Missouri Ores	24 00@24 50
No. 2 " " " "	23 00@24 50
No. 1 Mill, from Missouri Ores	23 00@24 50

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock Ores	37 00@40 00
" " Tennessee "	26 00@28 00
" " Alabama and Georgia Ores	28 00@35 00
" " Kentucky Ores	28 00@40 00

Milwaukee, Wis. March 27, 1877.

Specially reported by Messrs. R. P. Elmore & Co.

Lake Superior No. 1 Charcoal	$26 00
" " " 2 "	25 00
Lake Superior No. 1 Anthracite	25 00
" " " 2 "	24 00

Pittsburg, Pa. March 27, 1877.

Specially reported by A. H. Childs.

The transactions in pig iron during the past week have not been large, but it can scarcely be said that there is any change in the market. The supply of red short irons is limited and they are held with corresponding firmness, while the common run of cold shorts and neutral inclining to cold short are offered in abundance and sold at from one to three dollars per ton below the price of the scarcer metal.

No. 1 Foundry	23 00@24	—4 mos
" 2 "	22 00@23	"
Gray Forge	20 00@22	"
White and Mottled	18 0 @19	"
Warm blast Charcoal	23 00@29	"
Cold blast Charcoal Western	40 00@45	"

Philadelphia, Pa.

(Weekly report of the Philadelphia Iron Market, furnished by Messrs. Justice, Cox, Jr., & Co., Iron Merchants, 333 Walnut Street, Philadelphia. Week ending March 29, 1877.)

Pig Iron.—The demand continues in a small way, and No. 2 and gray forge have grown quite scarce. The continued demand for red short irons from Pittsburg has created an advance of a dollar per ton, though neutral brands are held firm but without advance. The shading in price, we note, is only on No. 1, No. 2 and forge holding steady as to price. We report sales of about 3,000 tons, and quote No. 1 $20 to $21; No. 2, $18 to $19: forge, $17 to $20 as to brand and quantity.

Manufactured Iron.—The demand for bars continues good in small orders at quoted prices. The desire to cut in prices manifested some months back has passed away and a firm feeling continues. Tank and plate iron are selling as for some weeks, only as requirements demand. We have nothing new as to skelp. The large orders promised have not as yet made their appearance.

Rails.—The market continues fairly active for steel, with more orders for iron than we have had to report for some time. We quote steel $49 to $50; iron, $35 to $40, all at mill.

Old Rails.—The demand continues for old rails with very few sales, as holders are above the prices buyers assert they can afford to give. We quote $21 to $21.50.

Old Wheels.—The large stocks of old wheels crowding on the market for the last few weeks have been about all bought up and holders are asking an advance. We quote $18 to $20.

Scrap.—Wrought is quoted $22 to $26; cast, $14 to $19.

Richmond, Va. March 26, 1877.

Specially reported by Asa Snyder, Esq.

Prices of charcoal pig iron remain unchanged. There is very little doing.

Virginia Cold Blast Charcoal Pig Iron			$27 to $33
" Warm " "	"	"	24 to 28
" " " Coke	"	1 X	23 to 24
" " " "	"	2 X	21 to 22
" " " "	"	3	20 to 21
" Anthracite	1 X		— to —
" "	2 X		— to —
" "	3		— to —

St. Louis, Mo. March 27, 1877.

Specially reported by Messrs. Spooner & Collins, Commission Agents for all kinds of Iron.

CHARCOAL.

Missouri No. 1 Found'y.	$23@25
" " 2 "	22@23
" Gray Mill	22@23
H. Rock No. 1 Found'y.	25@26
" " " 2 "	23½@24
" " Gray Mill	23@24
Tenn. No. 1 Foundry	23½@24
" " 2 "	22½@23
" Gray Mill	22½@23

COKE.

Alice H. R. Ex No 1 F'y.	26 50
" 1 "	25 50
B, " 1 "	24 50
" 2 "	23 50
Forge	23 50
Chat., Tenn. No. 1 Fd'y.	25 00
" " " 2 "	23 50
" " Forge	22 50
" " White Mtl'd	21 00

STONE COAL.

Missouri No. 1 Fd'ry.	25@24
" " 2 "	23@23
" Gray Mill	22@26
" White & Mt'd	21@22

COLD BLAST CHARCOAL FOR CAR WHEELS.

All Numbers.

Hanging Rock	35@46
Tennessee	30@33
Kentucky	30@33
Missouri	28@30
Georgia	28@30
Alabama	28@30
Assorted Bar Iron $2 25 rates.	
No. 1 Wrought Scrap 950. cwt.	
Heavy cast " 70 "	
Light " " 40 "	

METALS.

New York, Friday Evening, Mar. 30, 1877.

The very inclement weather of the earlier days of the week, with to-day as a semi-holiday, have kept the market for metals very quiet.

Gold Coin.—During the week under review the price of gold has ranged f om 104¾ to 105, and closed at 105.

Bullion.—The quotations of silver from London yesterday (this being Good Friday there are none) were contradictory, being 54¼d@55d, 54¾d@55d and 54d sellers. The latter we believe to be correct and upon it is based our quotation for fine silver in New York. The London price declined to 53¼d, afterwards advancing to 54¼d, which point was reached early Wednesday morning, but later in the day, on the award of the India Council bills at an advance on the previous week's sale of only ¼d per rupee, the market closed weak at 5 54¼d. The indications are that the market has a tendency to recede rather than advance at present.

Copper.—The business in this artic'e has been small and prices weaker. 19¼c. is now bid, with a sufficient quantity to meet all demands offered at 19¼c.@19¾c.

Tin.—Sales of about 1,000 slabs of Straits are reported to have been made at 16¾c. gold. Yesterday's cable quotation of Straits in London was £70 10/. In this market we quote in gold as follows: Straits, 16¾c. @16⅞c.; L. & F., 16c.; Refined, 16¼c.; and Banca, 19c.

Tin Plates.—With a moderate demand we quote, in gold, per box, as follows: Charcoal tins, $6.75, and ternes $6; coke tins, $5.87½@$6, and ternes, $5.50.

Lead.—About 300 tons of Newark lead were sold early in the week at 6½c. currency. The price to-day ranges from 6½@6.70c. Although business is quiet at present, ye. there re indications that the Western manipulator of this m ket will be able to hold it fairly firm for several mon s to come, after which, with more liberal supplie; t e market will probably fall under the control of natu,,l influences.

The San Francisco *Commercial Herald* of March 22, says: "The *Twilight* for New York carried 842,947 lb. pig lead. The *Colima* for New York, via Panama, had 300,881 lb. same."

Spelter and Zinc.—Spelter is very quiet and quoted at 6⅞c.@6¼c. Sheet zinc continues to be quoted at 7⅜@7¼c. currency.

Antimony is quiet at 12⅛@12⅝c. gold.

Quicksilver.—London quotes £7@7 10/ per flask, and San Francisco 40½c.@42c. gold per lb.

The San Francisco *Commercial Herald* of March 22, says of quicksilver: "The *Gaelic* for Hongkong, having been detained nearly a week past her regular day, will carry some 1,400 flasks or more; price, 42½c. Some sales for the steamer of the first proximo have been made at 42c., which may be called to-day's quotation. The ship *Twilight* for New York carried 200 flasks. The *Colima* carried en route for Callao 200 flasks, and to Mexican ports 215 flasks. At the close we hear of purchases made for the China steamer of April 1st, at 41c."

[The Salt Lake City Ore and Metal Market.

Mr. J. B. Meader, under date of the 24th inst., gives the following as the rates prevailing for argentiferous lead ores:

Argentiferous Lead (Base Bullion).—$74 per ton for lead. $1.18 per ounce for silver. $20 per ounce for gold. The quotation for silver is based upon the silver contents in the lead of 80 to 120 ounces per ton of 2,000 lb.

The *Georgetown (Col.) Miner* of the 24th inst., says: "The ore market during the past week has been slightly depressed, under the unfavorable quotations from England. The production of the mines, on the other hand, has more than made up the deficiency in prices, and everything gives token of a prosperous season.

SILVER QUOTATIONS IN LONDON.

The range for silver in London during the week, per oz., was as under:

March 24	53¾d.	March 28	54¼d.
" 26	53⅞d.	" 29	54½@55d.
" 27	54⅜d.		

FINANCIAL.

New York Stocks.

New York, Friday Evening, March 30, 1877.

The coal shares have attracted the principal attention at the Stock Exchange during the past week. The quotations have been very irregular and excited, for reasons explained in our coal trade article, yet the market closes slightly lower. The transactions have been enormous, and it is said some of the heavy holders have been unloading.

Delaware, Lackawanna and Western Railroad Company.—Nearly 400,000 shares of this stock changed hands during the past five days. (The Stock Board being closed to-day.) The closing quotation of 58⅛ shows a decline of about 4 per cent. from the highest price of the week.

Delaware and Hudson Canal Company.—42,000 shares of the stock of this company changed hands during the week at from 53 to 48¾, the latter price being the closing quotation yesterday.

New Jersey Central Railroad stock has sold to the extent of 6,500 shares at from 9⅛ to 8¾ per cent., closing at the latter figure. The financial situation of this company, as shown by the receiver, does not improve. That officer reports to the creditors of the company its mortgage liabilities: First mortgage, $5 000,000; interest due August 1, $175,000. Convertibles, $4,400,000; interest due May 1, $154 000. Consolidated, $15,000,000; interest due April 1, $262,500. Newark and New York, $600,000; interest due July 1, $21,000. Ten year loan, $3,278,000; interest due March 1, $114,730. Due to employes, 2403,427. The receiver expected to be able to pay the interest on the first mortgage bonds, but the interest on the others could not be paid. Beyond this he could make no promises. At the receiver's suggestion the holders of consolidated bonds have appointed a committee of investigation and conference. The Chancellor of New Jersey, on the 27th inst. ordered the receiver to pay dividends on stock of the South Branch and Newark and New York Railroads, due April 1st, payments to be made only on stock now held by the New Jersey Central Railroad Company, also the semi-annual dividend of 3½ per cent., due as rent for the New York and Long Branch Railroad on the 1st of April next, upon all the stock not held and pledged by the Central Railroad, and not held by J. W. Watson; and that he continue to pay the dividend on said stock on the 1st day of April and October in each year until further notice. It is stated that the business of the road has been steadily improving since the appointment of a receiver, and payments to employees will accordingly be made with more promptness hereafter.

Piedmont Railroad Company.—The coupons on the bonds of this company, due on the 1st proximo, will be paid on presentation in New York.

Salisbury Economic Fuel Furnace Company.—10 shares of the stock of this company were sold at auction during the week at less than one per cent.

Carbondale & Shawneetown Railroad Company of Illinois.—10 shares of this stock were sold at auction during the week at $2 for the lot.

Portage Lake & Lake Superior Ship Canal Company.—800 shares of this stock were sold at auction during the week for $15 for the lot.

St. Bernard Coal Company.—The annual meeting of this company will be held at Earlington, Ky., on the 2d of May.

Chicago Mineral Land Company.—The annual meeting of this company will be held in Chicago on the 11th of April.

Ishpeming Mineral Land Company.—The annual meeting of this company will be held in Chicago on the 11th of April.

American Coal Company.—200 shares of this stock were sold at auction on the 28th inst. at $37 per share.

Chesapeake and Ohio Railroad.—In the Virginia Circuit Court at Richmond, March 26, a final decree of foreclosure was granted and an order entered directing General Wickham, the receiver, to sell the property after giving 90 days' notice. The State of Virginia gave notice of an appeal from the decree. A concurrent decree of foreclosure and sale will, it is expected, be granted by the West Virginia Courts in a few days.

Miscellaneous Sales and Quotations.

Sales and quotations of the stocks and bonds dealt in here and at Philadelphia, for the week ending the 29th inst., are given in the following tables. The Philadelphia quotations will have a * affixed.

STOCKS.

	Quotations.—High.	Low.	Closing.	Sales Shares
American Coal Co	—	—	24	—
*Cambria Iron Co	—	—	60	—
*Pennsylvania Salt Manuf. Co	—	—	68½	—
St. Louis, I. M. & S	—	—	10	10
Spring Mountain Coal	—	—	50	—
BONDS.				
D., L & W. 7s, Convt., 1892	—	—	103½	—
" " 2d mtge., 1881	106	—	106	1,100
N. J. C., 1st mtge., new	105⅛	103	105⅛	52,000
" " 1st mtge., cons	53⅜	53	53¼	53,000
" " Convt	48¼	47½	48	35,000
L. & W.-B. Coal Co., cons	33	30	30	223,000
Am. Dock & Imp. 7s	45	—	40	3,000
D. & H. C. Co., 1st m., 1884	95¾	—	97	5,000
" " " " reg., 1891	96	94½	95½	23,000
" " " " 7s, 1877	—	—	97	—
" " " " reg. & con., 1894	—	—	92	—
St. L. I. M. & S., 1st mtge	95½	93	95⅛	10,000
Ches. & Ohio, 1st mtge	—	—	20	—
*L.V. RR., con. mtge., 6s, 1923	95¼	—	—	5,000
" " 2d mtge., 7s, 1910	107	106¾	—	2,000
" " reg. & con., 1898	105	—	105½	5,000
" " 1s mtge., 6s	—	—	—	—
*P. RR., 1st mtge., 1880	104¾	—	104¼	36,000
" Gen. mtge. reg. 1910	—	—	106	—
" Con. m. 6s. con. & reg. 1905	—	—	94½	—
*P. & R. RR. 7s, 1893	—	—	107	—
" " con. m. 7s. con. 1911	93½	—	93¾	35,000
" " Deb. 6s, 1893	40	—	—	1,000
" " New convt. 7s	50	—	50	14,100
" " Con. mtge. 7s reg	93¾	93	92	5,000
" " 6s 44-80	101½	—	101	1,000
*P. & R. C. & I. Co. Deb. 7s	50	—	50	17,000
*P. & R. C. & I. Co., Tamaqua T.	55⅛	50	50	99,000
*L. C. & N. Co. 6s, 1834	100½	—	100	1,600
" " RR. loan, '97	—	—	—	—
" " Con. mtge. 7s	—	—	—	—
" " Convt. gold, 1894	—	—	96	—
" " Gold loan, 1897	87½	—	86½	2,000
*Schuylkill Nav., 6s 1897	—	—	—	—
*Pa. and N. Y. Canal, 7s	105	—	—	2,000
Pa. Canal Co	—	—	—	—
Susquehanna Coal Co. 6s	—	—	—	—

Total transactions for the week.....$63c,800

Philadelphia Stocks.

PHILADELPHIA, Thursday Evening, March 29, 1877.

The market for coal shares closes firm at our quotations. Prices in all in instances, however, are decidedly lower. The total transactions for the week were about 110,000 shares.

Pennsylvania Railroad Company.—About 88,000 shares of this stock have changed hands at from 85⅛ to 81¼, closing at the latter figure. It is said that a route is being surveyed by this company for a branch about eighteen miles long from Bedford Division west to Meyersburg, Pa.

Reading Railroad.—21,561 shares of this stock were sold during the week at from 27⅞ to 26 per cent., closing ⅛ per cent. above the lower price. The directors of this company have been successful in making very favorable arrangements with the several classes of creditors of the road according to the following statement:

First—The interest on the first and second mortgages coming in the priority of lien are to be paid in cash in full.

Second—The interest coupons on the general mortgage bonds for three years from July, 1877, or the next ensuing six coupons, to be paid one-half in cash and the remaining half in scrip, bearing interest, to be paid three years after the date of the respective coupons.

Third—All payments of coupons of the debenture bonds to be suspended for the next five years, and scrip, bearing interest, to be at once given.

Fourth—Ten per cent. of the floating-debt obligations maturing in April, 1877, to be paid in cash, the remaining 90 per cent. to be renewed for the same period as the respective existing notes, and the several creditors to continue to hold the collaterals now in their hands without diminution thereof.

There is little or no reason to doubt that virtually all the floating debt creditors, both in this city and New York, will or have already accepted the propositions as to their claims The management have been in communication with the London agents respecting the proposals to the bondholders, and they express confidence that the English creditors will raise no serious objections to the plan. So far as respects the home bondholders, their acquiesence is counted upon by the management as assured.

This company has issued a new order, or rather directed the enforcement of an old one, which requires that no employee of the road shall hold any position in the government of any of the towns or cities on the line of the road. The order produced the greatest effect at Reading, where a large number of men are employed in the shops, and quite a number had been chosen members of the City Council and School Board—so many, indeed, that their resignation left one branch of the City Council without a quorum.

Lehigh Valley Railroad stock closes at 82 per cent., a decline of 2½ per cent. from the price of the previous day, which was the highest of the week. The sales scarcely reach 2,000 shares.

This company is reported as about to extend its line through Girardville, Pa. It is also reported that engineers have been staking out a new colliery for the Philadelphia Coal Company at Rappahannock.

Magnetic Iron Mining Company of Michigan.—The annual meeting of this company will be held on the 11th of April.

Cannon Iron Company.—The annual meeting of this company will be held on the 9th of April.

The Huntingdon and Broad Top Railroad Company will pay the coupons of their first mortgage bonds due on April 1st on the 2d proximo.

Shamokin Valley & Pottsville Railroad Company.—$2 000 of the 7 per cent. mortgage coupon gold bonds of this company were sold at auction during the week at 94 per cent.

Chesapeake & Delaware Canal Company.—13 shares of the stock of this company were sold during the week at $20 per share.

Copper Stocks.

Specially reported by Messrs. WILSON W. FAY & Co., Bankers and Brokers, Room 7 Traveller Building, 31 State Street, Boston.

BOSTON, THURSDAY EVENING March 29, 1877.

The market closes in about the same condition as we have quoted it for months past The fact is there is nothing doing. Prices, however, are fairly maintained, little stock pressing for sales. There has been little activity in Duncan, and it has advanced half a point, but closes to-night at 6 bid, a decline of ¼. The Pewabic held its annual meeting March 29 and substantially elected its old board. There was some opposition to the management present at the meeting representing some 4,000 shares. Quincy is particularly weak, 38½ best bid against 40⅝ March 26. Osceola holds firm at 23 bid with no stock offering under 25. In the small coppers market quiet.

The Eagle Harbor Copper Company has levied an assessment of 25c. per share, payable on the 16th of April.

Gold and Silver Stocks.

NEW YORK, FRIDAY EVENING, Mar. 30, 1877.

The sales for the week show a falling off of about 15,000 shares, being but 48,260. This is largely accounted for by the very disagreeable weather early in the week, and the exchanges being closed to-day. The market has been regular and prices well maintained.

The stocks attracting most attention were the Hukill of which 13,000 shares were sold; Merrimac, 8,750 shares; Seaton, 6 600 shares; Henry Tunnel Co. 3,100 shares; and Granville, 2,700 shares. The fluctuations in all of these have been within a very limited range. We are officially informed that to-morrow the Hukill, Seaton and Merrimac will declare dividends of one per cent. each payable on the 10th proximo. There are no important features in the market.

Recent information from the Bonanza mines says: "The drift on the 1,200-feet level connecting with the Curry shaft is now cleaned out and retimbered a distance of 300 feet. We have no special change to note of the ore breasts of the mine all are looking well. We have completed the west drift on the 1,550-feet level, which improves our ventilation, also admits of the extraction of ore in this portion of the mine. The west drift from the C & C shaft on the 1,650-feet level is being put in thorough repair, and we are breasting out about 50 tons of ore daily, and expect by the first of next month to have the sill in condition to breast out the amount of ore desired for all requirements. The south drift on this level designed to connect with the Consolidated Virginia deep winze is now advanced 25 feet south of the 1,650-feet level west drift and is in very fine ore. In consequence of the heavy flow of water in the C & C. shaft we have not been able to sink the snaft any the present week"

With reference to the condition of the mining market in San Francisco the *Commercial Herald* of the 22d inst. says:

"The mining share market assumed a sort of panicky condition during the period under review, and stocks have been brought to the hammer in an unmerciful manner by some of our brokers, who are apparently determined to make a clean-up of marginal deposits regardless of the effect it may have upon the general state of the market, which at best has been weak for months past. This has given additional aid to the bears, and the depression has been very marked in some of the principal stocks dealt in, but notwithstanding this very decided movement the bonanza stocks have held their own remarkable well under more than usually large offerings. A more than general weakness is, however, apparent at the close, so far as the less valuable stocks are concerned, and we fear a still further depression may be the result. So many mines fail to show intrinsic merit that it has been a wonder to us for years past how prices have been maintained, and only on a largely speculative basis could this be the case, so when dullness in merchandise business circles takes place, and profits are next to nothing, money naturally becomes shy, for there is an abundance of it in our banking institutions. We must also look for a sharp reduction of these fancy stock rates, and aconsequent decline in the volume of business in the Boards.

"Probably there has never been a time in San Francisco when money was in more abundant supply and rates lower than at present. In like manner, there have been but very few occasions when there was less money in general circulation, and a greater degree of discomfort produced by its absence. This statement simply explains the stagnation in business, caused to a great extent by the rickety and unsatisfactory condition of the mining stocks market, which seems to hang like a pall over all other interests. Nominally, interest rates are 9@11 per cent. per annum, but gilt-edged securities can find plentiful accommodation at 6¼@7 per cent."

In the recent using of the diamond drill on the 1,700-feet level in the Gould & Curry mine, a strong flow of hot water was tapped.

The Northern Belle Mining Company is crushing ore at the rate of over 100 tons per day which averages $40 per ton.

The Present Daily ore Production of the leading Comstock mines is as follows:

	tons.		tons.
Belcher	90	Consolidated Virginia	280
California	550	Justice	400
Chollar-Potosi	110	Ophir	125

The Justice Mine has yielded during the past six months bullion as follows:

September	$144.000	January	$236,400
October	174,000	February	236,283
November	180,000		
December	276 500	Total	$1,247,183

The California Mine has shipped $631,278 in bullion up to the 21st inst. on March account.

Sutro Tunnel Company.—The annual meeting of this company will be held on the 2d of April. The present total length of the tunnel is over 3 miles or about 16,500 feet. At the present rate of progress the header of the tunnel will reach the eastern corporate limits of Virginia inside of two months, and before the first of January, 1878, will strike the Comstock at a point 100 feet south of the Savage shaft at a depth of 1,750 feet below the surface of the mine The rate of progress for the month of January was 388 feet and for the month of February, 361 feet.

The following are the quotations of stocks dealt in on the New York Mining Exchange. As will be seen, the transactions have been very small, amounting to only 2,000 shares, 1,500 of which were in Lacrosse.

There is a movement on foot to unite the two mining Boards, and we believe such a union would be mutually advantageous.

Lacrosse Gold Mining Co., 1,500 shares at from 29c.@ 30c.

Bobtail Gold Mining Co., 300 shares at from $1.45 to $1.50.

American Flag Gold Mining Co., 100 shares at 9c.

Atlantic Copper Mining Co., 100 shares at $7.

Closing quotations yesterday were as follows:

	Bid.	Asked.
American Flag G. M. Co	7	10
Bobtail G. M. Co	$1 50	$1 55
Bobtail Tunnel Co	3 50	4 00
Lacrosse G. M. Co	28	29
New York & Colorado G. M. Co	1 50	2 00
Smith & Parmlee G. M. Co	10	....
Eureka, of Grass Valley, Cal., G. M. Co.	40	....
Allouez Copper Mining Co	5 00	10 00
Atlantic "	6 75	7 00
Calumet & Hecla Copper Mining Co	179 00	181 00
Central Copper Mining Co	34 00	38 00
Franklin "	10 50	12 50
Pewabic "	3 00	....
Quincy "	37 00	40 00

Holman Gold Mining Company of Colorado.—1,000 shares of the stock of this company were sold at auction during the week at less than 1 per cent,

The Quartz Gulch Placer Mine, located thirty miles west of Baker City, Oregon, gave a gold yield for the season of 1876 of $16,000, paying for water alone $6,000.

The Lile Gold Mining Company, located in Mariposa County, Cal., has declared a dividend of 20c. per share, equal to $20,000, payable on demand.

The El Dorado Water and Deep Gravel Company, of California, has levied an assessment of $2 per share.

Bank of California.—Recent sales of the stock of this institution have been made at $104@$105 per share.

The San Francisco Stock Exchange has paid dividends to its members as follows, the membership numbering 100: March, 1876, $20,000; April, $15 000; May, $10,000 June, $10,000; September, $10,000; January 10, 1877, $50,000; total, $115,000. The Board will pay no dividend this month.

The Pacific Stock Exchange has paid to each of its 75 members five monthly dividends of $100 each, equal to a total of $37,500.

The Empire Mine of Howard Flat, California, has declared a dividend of $1 per share.

The Black Bear Quartz Mining Company of California has declared a dividend of 25c. per share, equal to $7,500, payable on demand. There has never been an assessment on this stock. The dividends paid under the old and present management up to the close of 1876 have been as follows: 1867-72—Six years, old management, $196,647; 1873-76 Four years, new management, $461,500; total, $658.147. The mine is operated by British capital. Since January 1 there have been two dividends of $7,500 each, making 59 in all.

The Martin White Mining Company of the White Pine District, Nevada, made a recent shipment of bullion amounting to $42,000. This company owns several mines in this district, and state that with the present mill facilities they can turn out from $250,000 to $300,000 per month.

The Tip Top Silver Mine is located in Humbug District, Arizona A recent shipment of 13 tons of ore from this mine yielded $4,000. The company has recently made a very rich strike in the north drift of the main shaft, the ore being antimonial silver.

The Vulture Silver Mine, located in Arizona, made a recent shipment of bullion amounting to $15,000. This Company is crushing about 20 tons of ore per day.

The Tybo Consolidated Mine is shipping bullion at the rate of about $50 000 per month.

The Grand Prize Mine is producing bullion at the rate of about $60,000 per month.

INCORPORATIONS.

We note the recent organization of the following mining companies, in addition to the announcements in our issue of the 3d inst.:

Name of Company.	Location.	Cap. Stock.
Ortago Mining Co	California,	$5,000,000
Farrell " "	"	10,000,000
Camden " "	"	400,000
Lucky Jack Mining Co	"	5,000,000
Northern Light Mining Co	"	6,000,000
Henrietta Mining Co	"	10,000,000
Excelsior Water & Mining Co	"	5,000,000
Monroe Mill & Mining Co	"	5,000,000
Calpella Gravel Mining Co	"	10,000,000
Gold " " "	"	1,000,000
Lotta Gold Mining Co	"	4,200,000
Confidence Gold Mining Co	"	2,000,000
Cassidy Mining Co	"	3,000,000
New Dolcath Mining Co	"	100,000

COAL TRANSPORTATION AND MINING STOCKS.

(New York and Philadelphia.)

	Amount of Cap. Stock.	Shares issued.	Date, percentage and amount of latest dividend.	QUOTATIONS.g												SHARES SOLD.
				Sat.		Mon.		Tues.	Wed.		Thurs.		Fri.		Cl'g. Bid.	
				H'gst.	L'st.	H'gst.	L'st.	H'gst. L'st.	H'gst.	L'st.	H'gst.	L'st.	H'gst.	L'st.		
‡Consolidation Coal Co	$10,250,000	102,500	Jan. 1, '77, 2½	$256,250	25	....	23	....	25 —	....	....	....	....	....	....	....
‡Delaware and Hudson Canal Co	20,000,000	202,000	Aug. 1, '76, 4	800,000	50⅝	49¾	50¼	49⅜	51¾ 49⅝	53	50½	50½	48¾	....	....	42,633
‡Delaware, Lackawanna and W. RR. Co.	26,200,000	521,000 c	April 20, '76, 2½	647,230	60	58¾	59⅞	58¾	61 58⅝	62	59⅞	60⅜	58⅛	....	....	399,450
§Lehigh Coal and Navigation Co	10,448,550	208,971 c	Sept. 3, '76, 1½	156,728	44	43¾	43¾	43	44¼ 43	44¾	43¾	43¾	....	....	....	15,518
‡Lehigh Valley RR. Co	27,042,900	540,858 c	Apl. 15, '77, 1½	405,643	84	82¾	84	84	83⅛ 83	84⅛	84½	82	....	....	....	1,540
‡Maryland Coal Co	4,400,000	44,000	Jan. 31, '76, 1½	66,000	8	....	8½	....	8½	8⅝	....	8	....	....	....	....
‡New Jersey Central RR. Co	20,600,000	200,150	Apl. 20, '76, 2½	515,200	9	9	8¾	8⅝	9 8⅞	9⅛	8⅝	8⅞	8¾	....	....	6,445
‡Pennsylvania Coal Co	5,000,000	100,000 c	Feb. 1., 77, 5	250,000	*200	....	*200	....	*200	....	....	....	....	....	....	....
§Pennsylvania RR. Co	68,868,700	1,377,404 c	Feb. 26, '77, 2	1,377,374	85⅛	84½	85⅛	82⅞	83⅛ 82⅛	83⅜	82	81⅛	....	....	....	88,197
§Philadelphia and Reading RR. Co	34,278,755	685,554 c	Jan. 18, '76, 2½	†856,954	27¾	27	27½	26	27¼ 26¼	28	26⅜	26⅜	....	....	....	21,501

Total sales of Coal Stocks for the week..... 574,750

MINING STOCKS,

New York.

Name of Company.	Location.	Feet on Vein.	Capital Stock.	a No. of Shares.	Total Assessments Levied.	Date and Amount of Last Assessment per share.	Total Dividends paid.	Date and Amount of Last Dividend per share.	These quotations are in currency, and in the absence of final bid prices, are based on the latest sales as they occur during the operations of each day.						
									Sat.	Mon.	Tues.	Wed.	Thurs.	Fri.	
Alpha Cons. G. S.	Nevada,	300	$ 3,000,000	30,000	$180,000	Aug. 12, '75, $1.	....	.....	$	$	$	$16 25	$	$	400
Belcher, G. S.	Nevada,	1,040	10,400,000	104,000	864,400	Feb. 24, '77, $1.	$15,397,200	April 10, '76, $1.	6 87½	....	6 50	7 12½	....	....	700
Bertha Gold Co	Virgi'a.	645 acs.	300,000	30,000	**	.....	....	.....	9 37½	9 12½	8 87½	8 62½	8 50	....	3,200
Best and Belcher, G. S.	Nevada,	545	10,080 000	100,800	236,992	Feb. 6, '77, $1	....	.....	26 50	....	21 00	28 00	....	....	900
Bullion, G. S.	Nevada,	943½	10,000,000	100,000	2,202,000	Jan. 15, '77, $1.50.	....	.....	....	....	16 25	14 25	....	....	400
Caledonia, G. S.	Nevada,	2,188	10,000,000	100,000	1,310,000	Feb. 10, '77, $1.	....	.....	6 87½	....	7 25	7 00	....	....	400
California, G. S.	Nevada,	600	54,000,000	540,000	....	.....	11,880,000	Mar. 15, '77, $2.	46 75	....	49 37½	48 75	....	....	300
Centennial, G.	Califor.	66 acres	1,000,000	100,000b	....	.....	....	.....	....	....	....	....	....	....	....
Chollar Potosi, G. S.	Nevada,	1,400	2,800,000	28,000	1,282,000	June 26, '76, $5.	3,080,000	Feb. 10, '72, $1.	56 00	....	....	56 00	....	....	200
Cleveland, G.	Colo.	3,715	250,000	25,000b	**	.....	....	.....	6 00	6 00	6 00	6 00	6 00	....	1,700
Cons. Hercules & Roe, S	Colo.	16,500	1,000,000	100,000	**	.....	120,000	.....	....	....	....	....	....	....	.....
Cons. Imperial, G. S.	Nevada,	468	50,000,000	500,000	375 000	Mch. 10, '77, 25c.	....	.....	....	....	....	....	....	....	.....
Con. N. Slope & E.C.T.	Colo.	15,000	500,000	10,000	**	.....	....	.....	....	....	....	....	....	....	.....
Cons. Virginia, G. S.	Nevada,	710	54,000,000	540,000	411,200	June 11, '73, $3.	25,920,000	Dec. 11, '76, $2.	....	....	....	45 00	....	....	50
Confidence, G. S.	Nevada,	130	2,496,000	24,960	243,840	March 18, '73, $1.	78,000	May 1, '65, $8.33½	....	....	8 12½	7 62½	....	....	400
Crown Point, G. S.	Nevada,	600	10,020,000	100,000	1,273,370	Jan. 10, '77, $1.	11,588,000	Jan. 12, '75, $2.	8 62½	....	9 00	9 00	8 75	....	500
Douglas Mining Co	Colo.	21,000	1,000,000	10,000	**	.....	....	.....	....	....	....	....	....	....	.....
Eureka Cons. G. S. L.	Nevada,	..	5,000,000	50,800	100,000	May 26, '76, $1.	1,000,000	Aug. 5, '75, $1.	18 00	....	....	18 50	....	....	200
Exchequer, G. S.	Nevada,	400	10,000,000	100,000	280,000	Sept. 23, '76, $1.	....	.....	5 87½	....	....	6 12½	....	....	200
Gould and Curry, G. S.	Nevada,	621	10,800,000	108,000	2,134,000	Jan. 23, '77, $1.	3,934,800	Oct. 10, '70, $10.	12 37½	....	....	....	....	....	100
Grant, G. S.	Nevada,	1,000	10,000,000	100,000	....	.....	....	.....	....	....	....	....	....	....	.....
Granville Gold Co.	N. Car.	9,000	1,000,000	100,000	**	.....	....	.....	2 37½	2 37½	2 50	2 37½	2 37½	....	2,700
Hale & Norcross, G. S.	Nevada,	400	11 200,000	112,000	2,354,000	Jan. 22, '77, $1.	1,598,000	April 10, '71, $5.	....	5 00	5 00	5 00	5 37½	....	900
Henry Tunnel Co	Nevada,	3,000	2 000,000	80,000	**	.....	....	.....	5 37½	....	5 00	5 50	5 25	....	3,100
Hukill, G. S.	Colo.	3,288	1,000,000	100,000b	**	.....	20,000	Nov. 1, '76, $1	4 25	4 50	4 25	4 50	4 25	....	13,000
Indian Queen, S.	Nevada,	1,000	3 000,000	60,000	....	.....	60,000	.....	....	....	....	....	....	....	.....
Julia Cons. G. S.	Nevada,	3,000	11,000,000	110,000	220,000	Jan. 4, '77, $1.	....	.....	....	....	....	....	....	....	.....
Justice, G. S	Nevada,	2,100	10,500,000	105,000	1,502,500	Sept. 14, '76, $5.	....	.....	....	....	12 50	....	....	....	300
Kentuck, G. S.	Nevada,	95	3,000,000	30,000	270,000	Dec. 3, '74, $1.	1,252,000	March 8, '70, $5.	....	....	....	5 75	....	....	100
Kossuth, G. S.	Nevada,	2,700	5,400,000	108,000c	405,000	Aug. 15, '76, 50c.	....	.....	....	....	....	....	....	....	.....
Leopard, G. S.	Nevada,	1,500	5,000,000	50,000	50,000	March 31, '76, $1.	162,500	Dec. 15, '76, 30c.	....	....	4 50	....	....	....	300
Lucerne Mining Co	Colo.	4,200	5,000,000	500,000	**	.....	....	.....	1 62½	1 50	1 50	1 50	1 37½	....	1,500
‡Mari. L. & M. Co., pre.	Cal.	44387 ac	5,000,000	50,000	1,350,000	Feb. 17, '77, $1.	....	.....	5 00	5 00	....	....	....	....	.....
" " " com.	"		10,000,000	100,000	1,340,000	Feb. 17, '77, $1.	....	.....	5 00	5 00	....	....	....	....	200
Mer. and Min. Tun. Co.	Colo.	30,000	500,000	50,000	**	.....	....	.....	....	....	....	....	....	....	.....
Merrimac, S.	Mass.	1,500	500,000	50,000b	**	.....	50,000	March 10, '77, 10c.	6 37½	6 50	6 62½	6 62½	6 62½	....	8,750
Mexican, G. S.	Nevada,	600	10,080,000	100,800	100,800	Sept. 5, '76, 50c.	....	.....	....	....	....	16 50	....	....	200
Morning Star	Nevada,	1,600	8,000,000	80,000	....	.....	....	.....	....	....	....	....	....	....	.....
Northern Belle, S.	Nevada,	1,600	5,000,000	50,000	....	.....	1,100,000	March 12, '77, $1.	....	....	....	....	....	....	.....
Ophir, G. S.	Nevada,	675	10,080,000	100,800	2,034,400	May 14, '75, $2.	1,394,400	March 9, '64, $4.	....	....	....	....	....	....	.....
Original Comstock, G. S.	Nevada,	....	10,000,000	10,000	....	.....	....	.....	....	....	....	....	....	....	.....
Overman, G. S.	Nevada,	1,200	3,840,000	38,400b	2,222,280	Oct. 21, '76, $3.	....	.....	....	67 00	....	....	70 50	....	200
Pleasant View, G.	Colo.	1,200	200.000	20,000b	**	.....	....	.....	....	....	....	....	....	....	.....
‡Quicksilv. M.Co., pre.	Cal.	8500 acs.	4.291,300	100,000	**	.....	....	.....	21 50	21 25	21 25	21 50	21 25	....	.....
" " " com.	"	"	5,708,700	"	**	.....	....	.....	15 00	15 00	15 00	15 00	15 12½	....	100
Raymond and Ely, G. S.	Nevada,	5,000	3,000,000	30,000	540,000	Dec. 5, '76, $1.	3,075,000	Sept. 10, '73, $3.	....	....	....	5 12½	5 50	....	200
St. Joseph Lead Co. L.	Missou.	2600 acs.	1,000,000	100,000	....	.....	250,000	.....	5 87½	....	6 00	6 25	....	....	400
Santiago, G. S.	Nevada,	2,000	11,200,000	112,000	....	.....	....	.....	....	....	....	....	....	....	.....
Savage, G. S.	Nevada,	800	11,200,000	112,000	2,970,000	Jan. 27, '77, $1	4,460,000	June 11, '69, $3.	....	....	....	....	....	....	.....
Seaton, G. S.	Colo.	1,700	500,000	50,000	**	.....	....	.....	4 50	4 75	4 50	4 50	4 50	....	6,600
Seg. Belcher, G. S.	Nevada,	160	640,000	6,400	244,800	April 11, '76, $5.	....	.....	....	....	....	....	....	....	.....
Sierra Nevada, G. S.	Nevada,	3,650	10,000,000	100,000	1,600,000	Feb. 15, '77, $1.	102,500	Jan. 16, '71, $1.	....	....	....	....	....	....	.....
Silver City, G. S.	Nevada,	3,900	6,310,000	63,100	15,775	Nov. 16, '76, 25c.	....	.....	....	....	....	....	....	....	.....
Silver Hill, G. S.	Nevada,	5,400	10,800,000	108,000	864,000	Feb. 6, '77, $1.	....	.....	....	....	....	....	....	....	.....
South Comstock, G. S.	Nevada,	1,500	10,000,000	100,000	54,000	Jan. 30, '77, 25c.	....	.....	....	....	....	....	....	....	.....
South, California, G. S	Nevada,	1,500	5,000,000	50,000	....	.....	....	.....	....	....	....	....	....	....	.....
Southern Star, G. S.	Nevada,	1,500	6,000,000	600,000	....	.....	....	.....	....	....	....	....	....	....	.....
Trenton, G. S.	Nevada,	..	10,000,000	100,000	....	.....	....	.....	....	....	....	....	....	....	.....
Union Cons. G. S.	Nevada,	850	10,000,000	100,000	260,000	March 3, '76, $1.	....	.....	....	....	....	....	....	....	.....
West Belcher, G. S.	Nevada,	1,000	10,000,000	100,000	....	.....	....	.....	....	....	....	....	....	....	.....
Yellow Jacket, G. S.	Nevada,	1,200	12,000,000	120,000	2,838,000	March 2, '77, $1.	2,184,000	Aug. 10, '71, $2.50.	....	....	....	....	....	....	.....
Young America, S.	Nevada,	1,000	3,000,000	30,000	6,000	Oct. 23, '76, 20c.	....	.....	....	....	....	....	....	....	.....

Total Assessments levied to date, $32,054,357 Div'ds pd. to date, $88,706,400 Total sales of Mining Shares for the week..... 48,260

Boston.

									Fri.	Sat.	Mon.	Tues.	Wed.	Thurs.	
Allouez, C.	Mich.	..	$1,000,000	20,000c	$940,000	May 9, '76, $5.	....	.....	$6 00	6 50	6 25	6 co	6 00	6 00	.....
Calumet and Hecla, C.	Mich.	2¾ mile	2,000,000	80,000d	1,200,000	.....	$11,450,000	Feb. 15, '77, $5.	179 75	179 75	182 75	180 50	180 25	180 00	.....
Central, C.	Mich.	..	500,000	20,000c	100,000	June, '62, 65c.	1,160,000	Feb. 6, '77, $7.	33 50	33 75	33 50	33 87½	34 00	34 00	.....
Copper Falls, C.	Mich.	..	1,000,000	20,000d	535,000	May 10, '76,	100,000	Nov., '71, $1.	3 25	3 25	3 00	3 12½	3 00	3 00	.....
Dana, C	Mich.	..	500,000	20,000d	68,000	Jan., '73, 50c.	....	.....	10	10	10	10	10	10	.....
Dawson, S.	Canada	..	1,200,000	60,000f	....	.....	....	.....	13	14	15	14	14	13	.....
Duncan, S.	Canada.	..	1,200,000	60,000f	75,000	July, '76, 41⅔.	....	.....	5 75	5 62½	5 87½	6 00	6 12½	6 00	.....
Franklin, C	Mich.	..	500,000	20,000d	360,000	June, '68, $5.	585,000	Nov., '71, $1.	11 50	11 25	11 00	11 25	11 00	11 00	.....
Humboldt, C.	Mich.	..	500,000	20,000d	100,000	Sept. 28, '76, 15c.	....	.....	20	20	20	20	20	20	.....
International, S.	Canada.	..	1,200,000	60,000f	....	.....	....	.....	50	53¼	50	52¼	62½	62½	.....
Madison, C.	Mich.	..	50 1,000	20,000d	123,000	Sept. 11, '74, 10c.	....	.....	25	25	25	25	25	25	.....
Mesnard, C.	Mich.	..	500,000	20,000d	160,000	April 12, '65, 50c.	....	.....	40	40	38	37	39	40	.....
Minesota, C.	Mich.	..	1,000,000	20,000c	436,000	June 10, '69, $1.	1,820,000	Mch. 15, '76, 50c.	1 37½	1 25	1 37½	1 25	1 25	1 25	.....
National, C.	Mich.	..	500,000	20,000e	195,000	Oct., '75, $1.	360,000	Oct., '73, $1.	1 00	1 00	95	90	95	95	.....
Osceola, C.	Mich.	..	1,000,000	40,000d	880,000	May 1, '76, $2.	....	.....	22 50	22 25	22 00	23 00	23 00	23 00	.....
Petherick, C.	Mich.	..	500,000	20,000d	165,533	March 22, '76, 50c.	....	.....	25	25	25	25	25	25	.....
Pewabic, C.	Mich.	..	500,000	20,000d	185,000	June, '68, $3.	460,000	July, '73, $1.	3 37½	3 50	3 62½	3 50	3 50	3 50	.....
Phœnix, C.	Mich.	..	1,000,000	20,000d	817,500	Sept., '70, $3.	20,000	Jan. 20, '76, $1.	....	....	....	....	....	....	.....
Quincy, C.	Mich.	..	h 200,000	20,000b	....	.....	2,130,000	Feb. 15, '77, $4.	40 00	40 50	40 62½	39 75	38 00	38 50	.....
Ridge, C.	Mich.	..	500,000	20,000d	200,000	.....	90,000	Feb. 8, '75, $1.	3 50	3 37½	3 75	3 50	3 25	3 25	.....
Rockland, C.	Mich.	..	500,000	20,000d	495,000	Jan., '74, $1.	....	.....	..	..	..	..	..	..	.....
Star, C.	Mich.	..	500,000	20,000d	265,000	March 30, '76, 50c.	....	.....	25	25	25	25	25	25	.....
Superior C.	Mich.	..	500,000	20,000d	340,000	March, '74, 25c.	....	.....	10	10	10	10	10	10	.....

Total Assessments levied to date, $7,640,033 Div'ds paid to date, $18,175,000 Total sales..... — shares

G. Gold. S. Silver. L. Lead. C. Copper. a The par value of shares is $100, unless otherwise designated. b Par value $10. c Par value $50. d Par value $25 each. e Par value $15. f Par value $20. g Quotations represent the latest prices bid. Prices asked will have a * affixed. For readiness of comparison the quotations of Philadelphia Stocks the shares being $50 each, are based upon a percentage value, or 100, equal to shares of $100. h Full paid. i On the four old companies. † This company declared a dividend of 3½ per cent. on its preferred stock in July, 1876. ‡ New York Stock Exchange quotations. § Philadelphia Stock Exchange quotations. ** Non-assessable.

Name of Company.	Location.	Cap. Stock.
Con. Standard Gold & Silver Mining Co.	California,	1,000,000
Deadwood Mining Co.	"	500,000
Bonanza Quartz Mining Co.	"	1,000,000
Stone Lagoon Gold Mining Co.	"	1,000,000
Bella Gold Mining & Milling Co.	"	3,600,000
Archimedes Gold Mining Co.	"	1,000,000
La Rinconada Quicksilver Mining Co.	"	1,000,000
Bullion Consolidated Gold Mining Co.	"	5,000,000
Big Lagoon Mining Co.	"	800,000
Germania Con. Gold & Silv'r Mining Co.	"	300,000
Seventy-six Mining Co.	"	600,000
Silver Creek Gold & Silver Mining Co.	"	10,000,000
Black Hawk Tunnel & Mining Co.	Colorado,	250,000
Black Hills Hydraulic Gold Mining Co.	"	600,000
Santa La Saria Mining Co.	"	300,000
St. Vrain Mining Co.	"	500,000
The Carbonate & Metallic Lead Co.	"	1,000,000
The Aspinwall Mining & Milling Co.	"	600,000
Ouray Discovery & Mining Co.	"	50,000
Hemlock Con. Silver Mining Co.	Nevada,	10,000,000
Governor Consolidated Mining Co.	"	10,000,000
Donald Gold and Silver Mining Co.	"	10,000,000
Silver Lake Mining Co.	"	10,000,000
Astor Mining Co.	"	10,000,000
Silver Glance Mg. & Smelting Co.	Arizona,	5,000,000
Essex Mining Co.	"	10,000,000
Nabob Mining Co.	"	10,000,000
Richmond Basin Mining Co.	"	1,000,000
Ortago Mining Co.	"	5,000,000
Silver Crown Mining Co.	"	10,000,000
Amador Mining Co.	"	10,000,000
Northern King Mill & Mining Co.	"	10,000,000
" " Mining Co.	"	10,000,000
Silver King Mining Co.	"	10,000,000
Duyrea Milling & Water Co.	"	500,000
Flora Mining & Smelting Co.	Utah,	2,000,000
Monarch Mill & Mining Co.	"	10,000,000
Oxford Mining Co.	Maine.	200,000
Yalroola Gold Mining Co.	Georgia,	.....
Carmels Bay Coal Co.	"	3,000,000

Gas Stocks.

NEW YORK, FRIDAY EVENING, March 30, 1877.

We are reported no change in the market for gas stocks, and quotations remain as given in our last.

The Cumberland (Md.) Gas Difficulty.—With reference to the disuse of gas for street lighting in Cumberland, the principal reason assigned is the inability of the city to incur the expense. There are in the city 117 lamp-posts, in which gas is burned. At $30 each the expense is $3,510 per annum. In these lamps, members who have investigated the case state that coal-oil can be used at a cost of $9 a year each, including breakage of chimneys, repairs to lamps, etc. The price of gas to private consumers is $3 per thousand feet and to the city for use in the posts about $1.67 per thousand feet as each burner consumes 1 500 feet per month for which $2.50 is paid. Payment for all the gas used by the city is made in drafts, a nine-months' lot of which, representing about $2.800, the company has now on hand. The cost of changing the lamps, most of which are of the New York globe pattern, would be about $500, and, if the use of oil is continued, to this must be added the first cost of the globes and supports, probably as much more.

Citizens' Gas Company, of Brooklyn.—The semi-annual interest, due April 1, on the certificates of indebtedness of this company, will be paid on and after April 2

East Harmony, N. Y.—The streets lamps in this place have been changed from gas to naphtha.

Metropolitan Gas Company.—14 shares of this stock were sold at auction during the week at $141¼ per share.

The Albany (N. Y.) Gaslight Company yields to the pressure of the times and of public opinion, and reduces the price of gas to $2.50 per 1,000 cubic feet, dating from the 1st inst.

Brookline, Mass., Gas Company.—We note a recent auction sale of 20 shares of the stock of this company at $115¼ per share.

Cambridge, Mass, Gas Company.—12 shares of this stock were recently sold at auction at $136¾ per share.

The Good Effects of Gas Competition Illustrated.—The town of Harrison, in Hudson County, N. J., has been lighted for years by gas furnished by a company which charged $33 for each lamp. A new gas company was formed, and made a proposition to the Town Council to light the streets for $20 a lamp. The other company, through some of the Councilmen, had a proviso inserted in the proposed contract with the new company that the latter should be prepared to commence operations within a month. This it was proceeding to do when the old company discreetly reduced its rate from $33 to $20 a lamp.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad st., N. Y.

Companies in New York and Vicinity.	Cap. Stk.	Par.	last Dividend.	When Paid.	Bid.	Askd.
			pr.c			
Mutual, N. Y.	$5,000,000	$ 100	2½	Jan. '77	103	104
" " Bonds	90,000	1,000	†3½	Feb. '77		107
NewYork, "	4,000,000		5	Nov. '76	130	132½
Metropol. "	2,500,000	100	5	Sep. '76	140	144
" " Certf.	1,000,000	....	3½	" "	102	—
" " Bonds	500,000	1,000	3½	Dec. "		102½
Harlem "	1.850,000	50	4	Feb. '77	104	—
Manhattan "	4,000,000	50	10	Dec. "	218	221
Brooklyn, B'klyn.	2,000,000	25	5	Nov. '76	168	172
Nassau "	1,000,000	25	4	Jan. '76	80	—
" " Certf.	700,000	1,000	3½	Nov. '76	95	—
People's "	1,000,000	10	3½	Jan. '76	47	52
" " Certf.	300,000	1,000	3½	July '76	84	90
" " Bds	325,000	....	3	Feb. '77	90	96
Metropol. "	1,000,000	10	3½	Nov. '76	78	80
Wmsburgh "	1,000,000	50	3	Oct. '76	130	—
" " Certf.	1,000,000	....	3½	July "	100	102
Citizen's "	1,200,000	20	2½	Jan. '76	95	99
" " Certf.	320,000	1,000	3½	Oct. "	98	102
J. C. N.J.	750,000	20	5	July, '75	160	—
Centl. Westch. N.Y.	466,000	50	4	July. "	90	—
Subur'n " "	295,000	50	3½	Oct. '76	90	100

† Gold.

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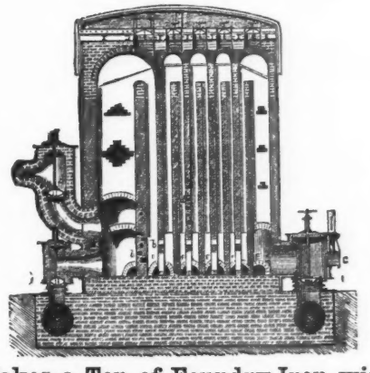

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Etna Iron Co., Ironton, O., 8 stoves, 4 stoves in blast.
Rising Fawn Iron Co., Ga., 3 stoves in blast.
Meier Iron Co., St. Louis, Mo., 8 stoves.
Southern States Coal, Iron, and Land Co., Tenn., 8 stoves.
Dunbar Furnace Co., Dunbar, Pa., 3 stoves.
Means & Co., Buena Vista Furnace, 3 stoves.
Hartford Furnace Co., Harford County, Md., 2 stoves.
And all the celebrated steel makers in the Old World.

Agents.

West Pennsylvania and West Virginia—Mr. BENJ. CROWTHER Isabella Furnace Company, Pittsburg.
Ohio, Indiana, Illinois, Missouri, Michigan, Wisconsin and Kentucky—Messrs. WITHEROW, SHEPARD & LAMOND, 173 Wood Street, Pittsburg.
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Only the best Materials and Workmanship are used in its construction.

*** For description and illustration of the Ball Stamp, and the cost of crushing ore, see ENGINEERING AND MINING JOURNAL, Dec. 2, 1876.

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The undersigned offers for sale the following valuable tracts of Coal Lands, immediately on the Kanawha River and the Chesapeake and Ohio Railroad—the latter running through their fronts over three miles. The same inclines that bring the Coal to that road may be used to dump it into the barges on the river, which is now being improved by the General Government for steamboat navigation the year round, to and above that point.

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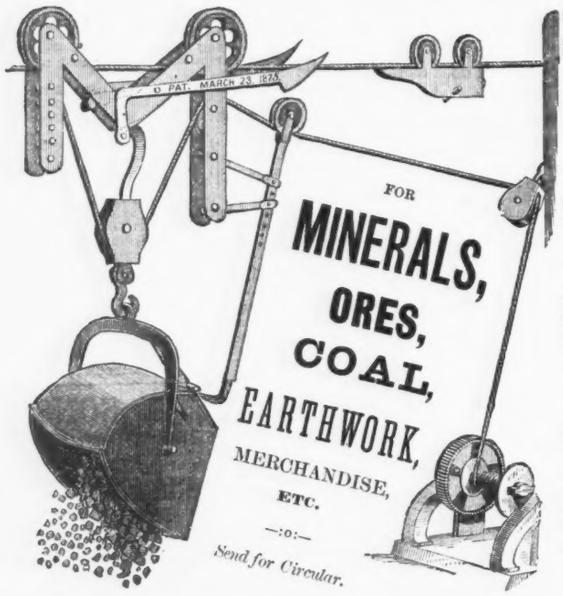

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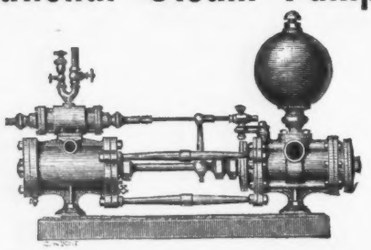

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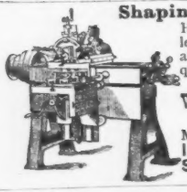

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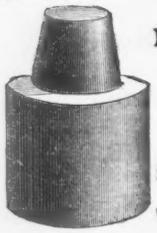

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